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The Interpretation of Cuzco Quechua Relative Clauses

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In Cuzco Quechua, the head of a relative clause may appear internally to the clause or in a post-clausal position. LF head-raising analyses suggest that these two S-structure types both yield externally headed LF structures. This paper shows that these analyses are not consistent with the meaning of some Quechua relative clauses. In particular, the effect of certain quantifiers on the position in which the head is interpreted is examined. When the head is quantified by *tukuy* 'all', the head appears to be interpreted externally to the clause, while *pisi* 'a little' induces an internal interpretation. These generalizations hold regardless of S-structure head position. The existence of *tukuy*-headed relatives is shown to defy cross-linguistic generalizations against definite internal heads. The *pisi*-headed relatives are shown to be amenable to an E-type anaphora analysis as proposed for Japanese internally headed relatives by [Hoshi 1995] and [Shimoyama 1999].

1 Introduction

An internally headed relative clause (IHR) is a subordinate clause which semantically modifies one of its own constituent nominals. Cross-linguistically this is a relatively rare construction, but it does show up in such diverse languages as Japanese, Quechua and certain North American languages, such as Mojave and Lakhota. Syntactically, it poses a challenge for theories of relative clauses (RCs) in which the modified nominal, or *head* of the RC is generated externally to the clause and coindexed with an internal element. Semantically, IHRs raise the question of how the head is recognized as the element to be modified.

The following pair of sentences illustrates an externally headed relative clause (EHR) (1) and an IHR (2) in Cuzco Quechua.[1,2]

(1) *[[Juan-pa ranti-sqa-n]* **waka***]-qa yuraq-mi ka-rqa-n.*
Juan-GEN buy-NM-3sg cow-TOP white-EVID be-PAST-3sg
'The cow that Juan bought was white.'

(2) *[[Juan-pa* **waka** *ranti-sqa-n]]-qa yuraq-mi ka-rqa-n.*
Juan-GEN cow buy-NM-3sg-TOP white-EVID be-PAST-3sg
'The cow that Juan bought was white.'

In (1) the head *waka* 'cow' appears outside the subordinate clause, while in (2) it is internal to that clause, reflecting the basic SOV word order of Quechua. Note that the RC is nominalized with the suffix *-sqa*, which is also marked for relative tense (main clause vs. subordinate clause). In a main clause, accusative Case is marked with the suffix *-ta*, while in a subordinate clause, the accusative Case marker is null (-∅). Hence the lack of overt Case marking on *waka*.

English allows only externally headed relative clauses, and hence syntactic and semantic analyses of relative clauses based on languages like English have typically assumed structures like that suggested by (3).

(3) $[_{DP}$ The cow $[_{CP}$ that John bought e]]

Here, *e* indicates the position in which the thematic role of *cow* within the subordinate clause would normally be assigned. One analysis of English relative clauses, which I will call the Operator analysis, suggests that the empty category e is the trace of an empty operator which is coindexed with *cow*, and which raises to SPEC of the subordinate CP. Note that in this analysis the *head* of the relative clause is the NP *cow*, which is adjacent to *the* within the outer DP.[3,4] The syntactic structure of the DP in (3) would hence be as shown in (4) under the operator analysis.

(4) $[_{DP}$ The $[_{NP}$ cow$_i$ $[_{CP}$ Op_i $[_{C'}$ that John bought $t_{Op_i}]]]]$

Most early work on IHRs (e.g. [Cole 1987]) assumed that IHRs and EHRs had essentially the same semantic distribution. Thus, languages allowing both constructions were seen as having a built-in optionality in terms of head position. For this reason, it was attractive to assume that both IHRs and EHRs had the same LF structure. Since the EHR structure was already consistent with the modificational meaning of a relative clause, it was naturally hypothesized that the head of an IHR raises covertly to look like an EHR head at the level of interpretation. This view is espoused by Cole [1987] for Ancash and Imbabura Quechua and also by Williamson [1987] for Lakhota, though with some differences in syntactic detail.

Some recent studies, however, suggest that it is incorrect to assume that EHRs and IHRs have essentially identical LF structures. First Basilico [1996] claims that IHRs are actually quantified NPs. It has further been shown in work on Japanese, that in fact the meaning of IHRs and EHRs is not always identical, indicating a need for independent semantic analyses of these constructions.

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[1]The following abbreviations are used in glosses in this paper: EVID=evidential marker, GEN=genitive case, ACC=accusative case, DAT=dative case, ABL=ablative case, TOP=topic marker, NM=nominalizer, EUPH=euphonic, DIMIN=diminutive, PL=plural, DELIM=delimitive, Q=interrogative particle.

[2]Unless otherwise noted, the examples in this paper come from my own 2000 fieldwork in Cuzco, Peru.

[3]I will refer to the DP (or NP) which contains a relative clause as the "outer" DP (or NP). In my own analysis I do assume the existence of a Determiner Phrase as proposed in Abney [1987].

[4]Another analysis, the Adjunction analysis of relative clauses, suggests that the relative clause is adjoined to the DP *the cow*. Such an analysis raises immediate problems for compositionality of the DP interpretation since the constituent 'the cow' suggests there is one unique contextually relevant cow (this problem is discussed by Partee [1976]). A solution to this problem proposed by Bach and Cooper [1978] is mentioned in connection with Quechua in Section 4.

This observation was made by Kuroda [1974], and recently developed in detail by Hoshi [1995] and Shimoyama [1999], who claim that IHRs are interpreted as independent sentences and the head is identified for its role within the matrix sentence via E-type anaphora.

In this paper I argue that a similar approach is necessary in (Cuzco) Quechua, but must be implemented in quite a different way. I limit the discussion to sentences in which an object[5] of the subordinate sentence is being relativized, as subject-relativized RCs are morphologically distinct from nonsubject-relativized RCs in Quechua.[6]

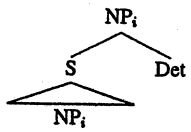
In Section 2 I provide summaries of the earlier analyses of IHRs mentioned above. In Section 3 I present some of the Quechua data which demonstrates the inadequacy of the previous theories to predict the interpretations of relative clauses in this language. In Section 4 I propose structures for certain Quechua relative clauses. In Section 5 I give further evidence for the proposed analysis involving quantifier scope interactions and the distributive suffix *-nka*. Section 6 is the conclusion.

2 Previous analyses of IHRs

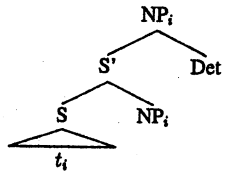
2.1 *Williamson 1987*

Williamson [1987] argues based on data from Lakhota that the head of an IHR raises at LF from its clause-internal position to a position which C-commands the relative clause (specifically, she suggests a position adjoined to the S of the relative clause). The determiner of the relative clause is external to S, being in SPEC of the outer NP, as shown in (5) and (6).

(5) S-Structure ([Williamson 1987, 24a]):



(6) LF ([Williamson 1987, 24b]):



Williamson demonstrates that in Lakhota there is an indefiniteness restriction on the head of an IHR, whereby in (5), NP$_i$ cannot be definitely marked (with a definite determiner or universal quantifier). The external Det, of course, has no such restriction. She explains this definiteness condition by suggesting that insofar as the relative clause is providing a restriction on the domain of the head NP, such a restriction is semantically incompatible with an NP which is universally quantified (that is, the quantifier's N'-complement itself is interpreted as the restrictive term). Referring to Heim's [1982] treatment of definite and indefinite NPs as quantifier-free variables, Williamson suggests that an NP marked with the definite determiner also cannot be the head of an IHR because it represents old information, which is then not compatible with further restriction. She goes on to predict that all languages allowing IHRs will also exhibit this definiteness restriction.

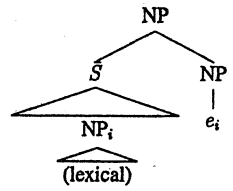
[5]Although subordinate-clause nominals bearing a variety of grammatical roles may be relativized, in this paper the examples I study involve direct object heads. Lefebvre and Muysken [1988, p.194] claim that a non-direct object internal head should play identically Case-marked roles in both the embedded and matrix clauses. My consultants' opinions varied widely on this question, and on the possibility of an internal oblique head. More research is necessary to clarify these judgments.

[6]Subjects and non-subjects are distinguished in Quechua in a number of ways. In the case of relative clauses, the nominalizing morphology is distinct: in subject-relativized RCs, the suffix *-q* appears on the verb, which is not inflected for subject agreement or for tense. Non-subject relativization is signalled by the suffixes *-sqa* or *-na* which are selected on the basis of relative tense. Roughly, they mark that the subordinate event occurs before or after the matrix event respectively.

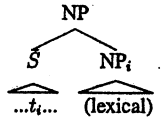
2.2 *Cole 1987*

Cole [1987] follows Williamson in suggesting that EHRs and IHRs have identical structures at LF, through raising of the internal head. However, he also argues that an IHR has an empty external head at S-structure, which is coindexed with the head noun within the relative clause. This empty head is then replaced at LF by the lexical head, which leaves a trace within the IHR. Both the empty external head and the LF-raised lexical head are adjoined to the outer NP. Thus, Cole suggests the following structures of an IHR at S-Structure (7) and at LF (8).

(7) S-Structure ([Cole 1987, 3]):



(8) LF ([Cole 1987, 4]):



Cole's work is based largely on data from Imbabura and Ancash Quechua, but he does not address the issue of definiteness in these languages, nor elaborate upon Williamson's definiteness restriction (note that his adjoined structure creates the same problems for semantic parsing mechanisms as does the Adjunction analysis of EHRs, mentioned in footnote 3).

2.3 *Culy 1990*

Culy [1990] provides a cross-linguistic survey and analysis of IHRs in nine languages. He finds that, to the extent that data is available, internal heads are incompatible with universal quantification in all these languages, as predicted by Williamson's analysis of IHRs. (He does include Quechua in his survey but apparently does not have access to examples of Quechua relative clauses with universal internal heads.) Culy's analysis of the syntax and semantics of IHRs is different from Cole's and Williamson's in that it assumes that the head NP is associated with a coindexed *wh* operator that moves to COMP at LF.

2.4 *Basilico 1996*

Basilico's [1996] proposal concerning IHRs is motivated by certain word-order facts in languages such as Diegueño and Mojave, wherein the internal head is disambiguated through clause-internal movement. That is, some IHRs in which the embedded sentence contains two objects are ambiguous with regard to the identity of the head unless the actual head has raised to a position which is higher than the other potential head, but still within the embedded clause. To explain this phenomenon, Basilico suggests that IHRs are instances of quantification, and as such become adjoined to the matrix IP at LF. The determiner of the IHR binds the variables in the IHR, which are associated to the internal head as well as to the RC restriction, and this determiner also adjoins to the matrix IP at LF. According to Basilico, the clause-internal movement of the head must take place at least in the covert part of the grammar in order for the quantification to obey Diesing's Mapping Hypothesis ([Diesing 1992]), which implies that indefinites must move out of the VP at LF in order to avoid existential closure and be bound by the determiner of the IHR. Basilico gives supporting evidence by showing (like Williamson) that the head of an IHR can only be an indefinite.

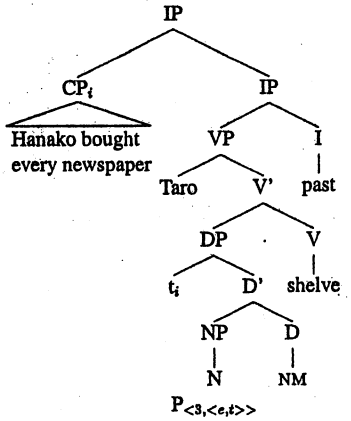
2.5 *Shimoyama 1999*

Shimoyama's [1999] theory of Japanese IHRs is significantly different from the last two in that she does not rely on the presence of an operator to bind the internal head. Rather, she assumes with Hoshi [1995] that the IHR is a closed sentence and its interpretation involves E-type anaphora. The idea is that the head is never raised out of its clause (or, indeed, its base position) but rather the role it plays in the matrix clause is understood through the context of utterance, which determines a null proform that combines the information present in the predicative part of the head with the information about the head provided by the rest of the IHR. The IHR as a whole will adjoin to the matrix IP at LF to give the proper interpretation.

For example, sentence (9) illustrates a Japanese IHR with a universally quantified head.

(9) *Taro-wa [[Hanako-ga* **dono sinbun-mo** *katte kita]-no]-o tana-ni narabeta.*
Taro-Top Hanako-Nom every newspaper buy_came-NM-Acc shelf-on placed
'Hanako bought (and brought) every newspaper and Taro shelved *them*.'
([Shimoyama 1999 36a])

(10) LF of (9) ([Shimoyama 1999, 36b]):



Shimoyama postulates an LF structure as in (10). The proform P is a free variable of type <e,t> which gets its denotation from the context c. Here, its meaning is given by the function g_c as follows.

(11) g_c:=[3→ $\lambda x \in D_e$. x is newspapers that Hanako bought].

Thus the gloss in (9) accurately represents the proposed interpretation.

Note that sentence (9) appears to be an example of precisely what Williamson, Culy and Basilico claimed not to exist: a universally quantified internal head.[7] Using data such as this, Shimoyama brings to light a number of facts concerning the interpretation of IHRs which were not remarked on by these previous studies. Most significantly, she points out that IHRs do not always have the same truth-conditions as their externally headed counterparts (both constructions are permissible in Japanese). For instance, if 'Hanako' is replaced by an existentially quantified DP in (9), then in the interpretation this DP must take scope over 'every newspaper', as would be the case in the corresponding independent sentence. However, if scrambling had occurred within the IHR, then it is the DP which would take wide scope over 'every newspaper'. These are exactly the facts of Japanese single-clause sentences, and they support the claim that IHRs should be interpreted with no raising of the head. If the head *were* to raise at LF, then we would expect 'every newspaper' to always take wider scope than the subject DP, regardless of whether embedded clause scrambling had occurred.

3 The Challenge Posed by Cuzco Quechua

In this section I present the data from Cuzco Quechua which remains unexplained under existing theories of IHRs. My analysis of this data appears in Section 4. Since the key IHRs all have

[7] In fact, Basilico does note similar-appearing S-structures in Mooré and Navajo, but suggests that in these languages the apparent universal quantifier might instead be functioning as a verbal operator.

quantified heads, I start out in Section 3.1 by briefly summarizing the Quechua quantifiers which appear in the IHR data.

3.1 *Quechua Quantifiers*

The quantifiers relevant to this paper are D-quantifiers (determiner-like), in the terminology of [Bach et al. 1995]. They are structurally part of a DP, typically appearing before the noun and adjective, if there is one. Although Quechua has no overt definite and indefinite articles, it does have non-quantificational apparent determiners in the form of the demonstratives *kay* 'this', *chay* 'that', and *haqay* 'yonder'. Sentences (12) and (13) illustrate one property of Quechua quantifiers which indicates that they are D-quantifiers: when the quantifier does appear in a non-canonical position within the sentence, it must receive its own Case marking. This is considered a general syntactic diagnosis in Quechua for movement out of a DP in an argument position, discussed by Lefebvre and Muysken [1988].

(12) *Llipi-n runa-kuna-ta riku-rqa-nki-chu?*
All-3 person-PL-ACC see-PAST-2sg-Q
'Did you see all the men?' ([Lefebvre & Muysken 1988, p.142])

(13) *[e$_i$ Runa-kuna-ta] llipi-n-ta$_i$ riku-rqa-nki-chu?*
person-PL-ACC all-3-ACC see-PAST-2sg-Q
'Did you see all the men?' ([Lefebvre & Muysken 1988, p.142])

Note that in (12), the quantifier *llipin* 'all' (which, incidentally, appears to have the same distribution as *tukuy* 'all') is not Case-marked, and appears in its canonical position before the head noun *runakuna* 'people'. By contrast, in (13), *llipin* appears to the right of the head noun, and the fact that it is no longer part of the DP is indicated by the accusative Case-marking which now appears on the moved element.

Since Quechua allows a great deal of null anaphora, the noun itself may be omitted if it is understood, in which case the relevant Case-marking (which appears on the last element of the NP) will be located on the adjective or on the determiner or quantifier.[8] This possibility is illustrated in examples (14) and (15).

(14) *Juan wakin llama-lla-ta rikhu-ra-n.*
Juan some llama-DELIM-ACC see-PAST-3sg
'Juan saw some (of the) llamas.'

[8]Lefebvre and Muysken [1988], adopting a strong view of the lexical hypothesis and presenting evidence that at least certain Case markers are indeed affixes and not clitics, argue that adjectives and determiners are really nominal in nature. For the purposes of this paper, I will begin with the assumption that quantifiers are determiners, although the identity of the true quantifiers in this sense will be clarified later in Section 4. In [Bittner & Hale 1995] it is argued that Warlpiri D-quantifiers are themselves nominal (and indeed that Warlpiri makes no use of the category "determiner"). However, Quechua differs from Warlpiri in that the base structure of a non-clausal Quechua DP is fairly fixed (movement aside, as discussed above) while the corresponding structures in Warlpiri are quite free. For these reasons, I assume that Quechua quantifiers do have access to the structural position D, and withhold judgment on whether they can also head NPs.

(15) *Juan wakin-lla-ta rikhu-ra-n.*
Juan some-DELIM-ACC see-PAST-3sg
'Juan saw some of them.'

As in many other languages, Quechua distinguishes between strong and weak quantifiers, as defined in [Milsark 1977]. As discussed in that work (and variously by Barwise and Cooper [1981], deHoop [1995] and others), existential constructions provide the canonical environment which distinguishes between the two. Thus, in English we call *some* a weak quantifier as evidenced by the acceptability of such sentences as *There are some llamas in the field.* By contrast, *most* is a strong quantifier as indicated by the unacceptability of **There are most llamas in the field.*

In Cuzco Quechua, *there*-sentences are expressed using the third singular form *kan* of the verb *kay* 'to be.' (This verb is obligatorily dropped in copula constructions with third person singular subjects, so there is no ambiguity.) Sentences (16) and (17) show that *ashka* 'a lot' is compatible with the existential construction while *tukuy* 'all' is not.

(16) *Ashka llama-kuna chacra-pi ka-n.*
many llama-PL field-LOC be-3sg
'There are many llamas in the field.'

(17) **Tukuy llama-kuna chacra-pi ka-n.*
all llama-PL field-LOC be-3sg
'There are all llamas in the field.'

Table 1 below lists the Quechua quantifiers mentioned in this paper, with English gloss and classification as strong or weak according to the above criterion. Note that I have not identified cases in which a determiner may be both strong or weak depending on context, although such cases certainly occur in other languages and may also exist in Quechua.

Table 1: Quechua Quantifiers

Quantifier	English gloss	strong/weak
ashka	many, a lot	weak
huk, iskay, etc.	one, two, etc.	weak
pisi	a few, a little	weak
sapa[9]	each, every	strong
tukuy	all	strong
wakin	some (of)	strong

3.2 *IHRs with Quantified Head*

As discussed in Section 2, sentences in which the head of an IHR is a quantified NP can provide important evidence for or against various structural possibilities. Recall that Cole's [1987]

[8]I note in passing that *sapa* is, in fact, compatible with the test sentence, but in this environment takes on the meaning 'only', and thus can appear, for instance, before a proper noun as well as before *llama*. This use of *sapa*, however, often triggers person/number agreement of *sapa* with the following noun.

analysis of (Ancash and Imbabura) Quechua assumes that an IHR and its corresponding EHR have identical meanings and therefore an analysis in which both structures look identical at LF should be advantageous from the perspective of parsing complexity. By contrast, Hoshi [1995] and Shimoyama [1999] point out certain important differences in the meaning of EHRs and IHRs in Japanese, necessitating distinct parsing mechanisms.

In Cuzco Quechua, I find that most EHR and IHR pairs, even those with quantified heads, are semantically indistinguishable. (The exceptions involve the distributive suffix *-nka*, which is discussed in Section 5.3.) Thus, sentences (18) and (19), containing an IHR and EHR respectively, both have the same interpretation, compatible with an external head at LF.

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

(19) *[[Juan-pa tayta-n-pa ruwa-sqa-n]* **wakin wasi***] hatun-mi.*
Juan-GEN father-3sg-GEN make-NM-3sg some house big-EVID
'Some houses that Juan's father made are big.'

The translations suggest an interpretation compatible with an LF-raising analysis, along the lines of Cole's [1987] or Williamson's [1987] proposals. However, the fact that the LF head-raising analysis does not fully capture the facts of Quechua RCs is revealed when we consider data in which the head is quantified by the weak quantifier, *pisi*. The following IHR/EHR pair of sentences ((20) and (21)) shows that this quantifier does not allow its NP to take scope over the relative clause, as might be expected under Cole's or Williamson's analysis.

(20) *[[Asunta-q* **pisi aqha** *aqha-sqa-n]]-ta apa-ra-ni*
Asunta-GEN a little cornbeer make_corn_beer-NM-3sg-ACC bring-past-1sg
'Asunta made a little corn beer and I brought it (the little corn beer that she made).'

(21) *[Asunta-q aqha-sqa-n]* **pisi aqha***]-ta apa-ra-ni*
Asunta-GEN make_corn_beer-NM-3sg a little corn_beer-ACC bring-past-1sg
'Asunta made a little corn beer and I brought it (the little corn beer that she made).'

In this case, it is the IHR version (20) which conforms to the Japanese-style interpretation, while the EHR version (21) has, again, the *same* meaning, which would not be expected in Japanese. Furthermore, these sentences clearly state that Asunta only made a little cornbeer and I brought that entire quantity.[10]

[10]Srivastav [1991 p.103], in her dissertation on correlative clauses, mentions that the following sentence from Ancash Quechua (which is quite distantly related to the Cuzco dialect) exhibits an interpretation pattern in line with the interpretations of the *pisi*-headed sentences above.

nuna ishkay bestya-ta ranti-shqa-n alli bestya-m ka-rqo-n
man two horse-ACC buy-PERF-3 good horse-Validator be-PAST-3
'The two horses that the man bought were good horses.'

Srivastav notes that this sentence includes the information that the man bought (only) two horses. She further indicates that this is not the case for the externally headed version. The same maximalizing property of Quechua IHRs is reiterated also in [Grosu & Landman 1998]. If these facts are correct for Ancash Quechua, then they indicate a pattern more similar to Japanese than to Cuzco Quechua, but still problematic for such previous treatments as Cole [1987]. However, to my knowledge these facts have not previously been further investigated.

My consultants uniformly reject the possibility of continuing with "...but I left the rest behind," or any other suggestion that Asunta could have made more than a little cornbeer. That I brought all that she made is implied by both sentences. To express that Asunta made a little cornbeer and I only brought a little of that, one consultant suggested (22).

(22) *[[Asunta-q pisi aqha aqha-sqa-n]]-manta pisi-lla-ta*
Asunta-GEN a little cornbeer make_cornbeer-NM-3sg-ABL little-DELIM-ACC
apa-ra-ni.
bring-PAST-1SG
'Asunta made a little cornbeer and I brought only a little of it.'

To further complicate this picture, when the head of the relative clause is quantified by the strong quantifier *tukuy* 'all', the head is interpreted with mandatory wide scope over the relative clause. This is illustrated in sentences (23), which contains an IHR, and (24), with an EHR.

(23) *Asunta [[Mayta-q plaza-pi* **tukuy planta** *planta-sqa-n]]-ta p'iti-ra-n.*
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.'

(24) *Asunta [[Mayta-q plaza-pi planta-sqa-n]* **tukuy planta***]-ta p'iti-ra-n.*
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.'

Both (23) and (24) can be followed up with a statement like "...but she did not touch the rest of the plants in the plaza (the ones that Mayta did not water)."

Recall that according to the generalizations and predictions of Williamson [1987] and Culy [1990], universally quantified heads should not be allowed in an IHR, as we have in (23)[11]. Now, this generalization is also contradicted by Japanese, but in Japanese the expected translation of the equivalent sentence would be 'Mayta planted all the plants in the plaza, and Asunta pruned them.' Thus, sentence (23) is surprising under any previous analysis of IHRs.

4 The Structure of Quechua RCs

In this section I propose LF structures for two types of Quechua relative clause.

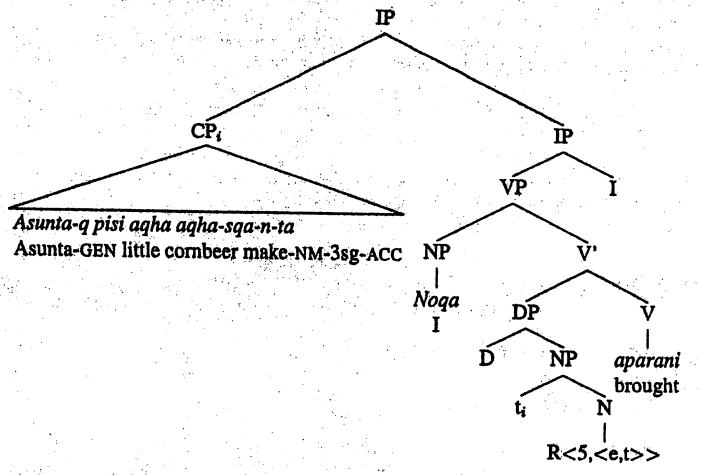
First, to accommodate the *pisi*-headed data in (20) and (21), in which we find that the content of the subordinate clause is implied by the matrix sentence, I propose that an E-type anaphora interpretation is appropriate for both IHRs and EHRs in Quechua. That is, I propose that the EHR construction is not in fact one in which the head takes interpretive scope over the relative clause. Either the external head is reconstructed to a clause-internal position at LF, or perhaps the apparent external head is simply the result of clause-internal scrambling.[12] Either way, the subordinate sentence is interpreted as a proposition, and the head is recognized by E-type anaphora.

Concretely, I propose the following LF Structures for the sentences in (20) and (21).

[11]The fact that Quechua internal heads do not appear to be restricted to indefinites is also mentioned in Footnote 12 of [Cole & Hermon 1994].

[12]The exact nature of the clause-final head position deserves further research. Lefebvre and Muysken [1988] claim that all nominalized clauses must be verb-final, citing evidence that this is the case in nominalized complement clauses. For relative clauses the situation is more complex, however. In fact, Lefebvre and Muysken identify a "COMP-like

(25) LF of (20), ((21) similar):



R is a variable of type <e,t> which receives its denotation from the context of utterance via the following assignment:

(26) $g_c := [5 \rightarrow \lambda x \in D_e.\ x$ is cornbeer that Asunta made]

Thus, the calculation of the extension of the DP will in essence involve the functional application of the definite determiner to the contextually-determined property:

(27) [[DP]]=[[D]]([[NP]])=[$\lambda f \in D_{<e,t>}$. the maximal entity x such that $f(x) = 1$]([$\lambda x.\ x$ is cornbeer that Asunta made]) =The maximal entity x such that x is cornbeer that Asunta made.

Here I have basically adopted Shimoyama's [1999] structure of IHR sentences in Japanese, with a couple of minor changes. First, I place CP as the sister to N rather than in [SPEC,DP] to allow a greater parallel with other relative clause constructions in Quechua, and in keeping with syntactic arguments made by Hoshi [1995:4.2.1.1.2] in support of NP-internal RCs. Secondly, note that the nominalizing morphology in Quechua (a verbal suffix) does not lend itself to a Determiner analysis, as Shimoyama suggests for *-no* in Japanese. Thus in (25), D is null, though apparently definite in accordance with the maximality effect of E-type anaphora (as in Sells [1986]).

Case position" which is rightmost in an IHR, but still not external to the clause. Based on Case-marking and distribution phenomena, they distinguish this position from that of a true external head. Because of certain data discrepancies, I do not pursue this possibility in this paper, but simply note that the nature of the right-most head position is still in need of clarification. If, indeed, scrambling is not a viable explanation for the apparent head-final structures, then reconstruction to base position at LF still seems possible. The main point is that this position empirically does not give interpretive scope over the RC in the case of a *pisi*-quantified head, nor even is it a syntactically viable scope position in the case of strong quantifiers, as will be discussed below.

Another possibility, which I reject, is that *pisi*-quantified heads do raise at LF to an interpretive position with scope over the relative clause, but that there is something about *pisi* which induces a definite interpretation. However, in simple matrix clauses, there is no tendency to interpret *pisi* as a definite, as seen in (28), where there is no implication that there was only a small amount of cornbeer available.

(28) *Noqa pisi-(lla) aqha-ta ukya-ra-ni.*
I a little-(DELIM) cornbeer-ACC drink-PAST-1sg
'I drank a little cornbeer.'

Recall that in Williamson's analysis of Lakhota (a language with overt definite and indefinite articles), the definiteness restriction held for an internal head, but there was no restriction on the definiteness of the external determiner, of the outer DP. That is, either a definite or an indefinite article could appear in that position. Thus, it would be unexpected if Quechua, under the head-raising analysis of IHRs, had a null article in this position which had a forced definite interpretation.

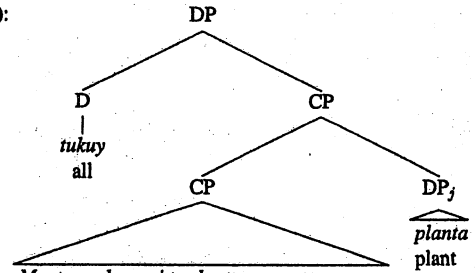
The E-type anaphora analysis accounts for the data in (20) and (21), but still does not explain why other quantifiers behave quite differently from *pisi*. In particular, in (23) and (24), we saw that *tukuy*-quantified heads receive mandatory wide scope over the relative clause. Furthermore, we saw that the LF-raising of a universally quantified head appears to violate syntactic and semantic restrictions which prohibit this configuration in other IHR languages.

To begin to answer the question of how exactly the *tukuy*-quantified RCs are to be interpreted, I note first that (23) and (24) have a paraphrase in which the quantifier appears explicitly in front of the relative clause, shown in (29).

(29) *Asunta* **[tukuy** *[Mayta-q plaza-pi* **planta** *planta-sqa-n]]-ta p'iti-ra-n.*
Asunta all Mayta-GEN plaza-LOC plant plant-NM-3sg-ACC prune-PAST-3sg
'Asunta pruned all the plants which Mayta planted in the plaza.'

In (29), the general proposal of Williamson [1987] for Lakhota neatly supplies a structure in which *tukuy* appears in the Determiner position of the outer DP. In this position this quantifier has scope over the relative clause, in keeping with the gloss. The LF structure of (29) would then be as in (30).

(30) LF head-raising in (29):



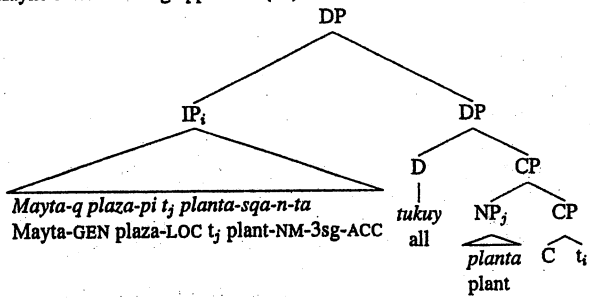
Returning to (23) and (24), in which the quantifier appears adjacent to its associated nominal, there are two related issues to be addressed by any proposal regarding their LF structure and mechanism of interpretation. First, the quantifier is apparently interpreted outside of its S-structure clause, in violation of broad cross-linguistic evidence for the clause-boundedness of strong quantifiers. Second, the associate of the quantifier at S-structure (apparently just the nominal 'plant') seems to be different from the associate of the quantifier at the interpretive level (apparently the entire phrase 'plant that Mayta planted'). I mention here briefly some possible approaches to each of these issues, which I do not attempt to decide between. A complete solution will require more data than is currently available, and I leave this to future research.

Basilico [1996] addresses the second of these points (the LF disassociation of the apparent Determiner from its apparent sister nominal) by suggesting that a universal quantifier associated with an internal head may not be a Determiner at all, but rather a verbal operator. This he proposes in response to the existence in Mooré [p.524] and Navajo [p.529] of certain examples in which an internal head appears to be associated with a universal quantifier (contra his generalization that this configuration is impossible). These examples look very much like (23). Basilico's verbal operator theory is compatible with his theory of IHRs because it identifies the head as simply an unquantified nominal, which then provides a variable which can be bound by an external determiner. Even if it turns out that *tukuy* is functioning in sentences such as (23) as an A-quantifier (as opposed to a D-quantifier), however, the clause-escaping ability of that quantifier still requires explanation. Basilico does not address this problem in his discussion of Mooré and Navajo.

Another proposal for relative clause structures which takes care of the apparent disassociation problem but not the island-escaping problem is that in [Bach & Cooper 1978]. This proposal attempts to outfit the adjunction analysis of relative clauses with an appropriate interpretation scheme. Briefly, Bach and Cooper propose that a DP can contain a free property variable, and an adjoined relative clause can function to supply this property. For example, in the English DP in (3) ('the cow that John bought'), *the cow* would contain a free property variable, supplied by the property expressed by the relative clause: being bought by John. This proposal could be applied directly to the structure of the EHR (24) and extended to the IHR (23) if LF head-raising is applied to the entire inner DP. Like Basilico's verbal operator proposal, this solution still would not explain how the strong quantifier has escaped its clause.

An entirely different approach which immediately gives an appropriate structure for (24) is that of Kayne [1994]. Briefly, Kayne suggests that even externally headed relatives are derived via head-raising from an initially internally headed syntactic structure. An S-structure like (24) is generated by moving the embedded IP to adjoin to DP. The relevant S-structure is shown in (31).

(31) Kayne's head-raising applied to (24):



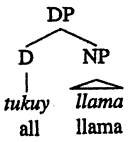
However, this explanation for (24) does not address (23), with its internal head.

Finally, a possibility more in keeping with the intuition that (23) and (24) are interpreted in the same way, is that these sentences are related to their paraphrase (29) by movement. This would suggest that the structure in (30) is essentially the correct LF structure also for (23) and (24). This is the most straight-forward structure schematically, but the question of when a universally quantified DP may escape its clause in Quechua would need to be resolved, as would the question of the nature of the trace of the moved quantifier.

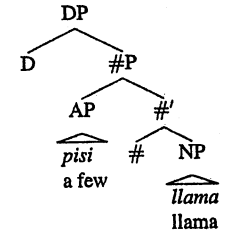
If the LF structures of the *tukuy*- and *pisi*- headed clauses are as I have suggested in (25) and (30), the question remains as to what induces the different interpretive positions of these quantifiers. A possible explanation for this difference lies in syntactic analyses of weak and strong quantifiers which suggest that these two quantifier types actually occupy different positions within the DP. Here I adopt the general analysis of DP structure in Bowers [1990]. Bowers suggests that strong quantifiers are true determiners which occupy the head position of a DP, whereas weak quantifiers are actually adjectival adjuncts to a Number Phrase (#P) appearing between DP and NP.

Thus, taking *tukuy* and *pisi* to be classic strong and weak quantifiers respectively, (32a) and (32b) show the expected structure of two quantified nominals.

(32) (a) *tukuy llama*
all llama
'all llamas'



(b) *pisi llama*
a few llama
'a few llamas'



If these structures are correct, then clearly *pisi* is not eligible to occupy the head position of the outer DP, as was proposed for *tukuy* in (30).

In fact, some immediate evidence for this syntactic analysis comes from the fact that the position available to *tukuy* in front of the relative clause is indeed unavailable to *pisi*. Thus (29) contrasts with the ungrammatical (33).

(33) **Pisi [[Asunta-q aqha aqha-sqa-n]]-ta apa-ra-ni.*
little Asunta-GEN cornbeer make.cornbeer-NM-3sg-ACC bring-PAST-1sg
'I brought a little cornbeer that Asunta made.'

More research is necessary in order to understand the full implications of this contrast. For now the main point is that *tukuy* seems to have the ability to take wide scope over a DP that contains it. I do not yet know what restrictions there are on the nature of the embedding.[13]

I leave to further investigation the details of the positions of other Quechua quantifiers. Although other quantifiers seem to follow the general pattern predicted by these trees and their status as strong or weak,[14] consultants' judgments vary in some cases. This could indicate that in fact some Quechua quantifiers do have both strong and weak readings.

5 Further Evidence

In this section I will offer further evidence for the generalizations and analyses presented in the previous sections, and argue against some alternative analyses.

5.1 *Scope interactions between the RC head and a matrix clause quantified DP*

I have found that quantifiers within a clause can engage in scope ambiguities similar to those observed in English. One such example is illustrated in (34). Here, the subject is quantified by *tukuy* 'all' and the object is quantified by *huk* 'one'. Either quantified nominal may have wide scope at LF.

(34) *Tukuy llama-(kuna) huk platanu-ta mikhu-ra-nku.*
all llama-(PL) one banana-ACC eat-PAST-3PL
'All the llamas ate one banana.' (one each or one total)

It is interesting, then, to note how these scope possibilities are affected by the presence of a relative clause modifying either the subject or the object. Consider the following two sentences (35) and (36).

(35) *[[Juan-pa* **tukuy llama** *ranti-sqa-n]] huk platanu-ta mikhu-ra-nku.*
Juan-GEN all llama buy-NM-3sg one banana-ACC eat-PAST-3sg
'All the llamas that Juan bought ate one banana (each).'
'All the llamas that Juan bought ate one banana (together).'

(36) *Tukuy llama [[noqa-q* **huk platanu** *ranti-sqa-y]]-ta mikhu-ra-nku.*
All llama I-GEN one banana buy-NM-1sg-ACC eat-PAST-3PL
'I bought one banana and all the llamas ate it.' (All the llamas ate the one banana that I bought (together)).
*'All the llamas ate one banana that I bought (each).'

In (35), the same basic sentence as (34) is repeated but this time the subject *tukuy llama* is the internal head of a relative clause. Consultants report that both translations given in the glosses are appropriate here, too, indicating that the ability of the head to interact with another matrix clause quantifier is not affected by the relative clause. This is consistent with an analysis in which the universally-quantified head is external to the RC at LF. By contrast in (36), in which the object *huk platanu* is the head of an IHR, consultants report that the sentence must mean that one banana total was bought, effectively indicating that *huk platanu* 'one banana' is no longer participating in scope interactions within the matrix clause. This is consistent with the E-type anaphora analysis of relative clauses with weakly quantified heads.

5.2 *Scope interactions between the RC head and the RC subject*

Further evidence for the E-type anaphora analysis of relative clauses with weakly quantified heads, and against an analysis in which a raised head sometimes has a forced definite interpretation comes from sentences in which the subject of the relative clause is quantified. An example is given in (37). Here, the internal head is quantified by *huk*, 'one', which appears to induce a narrow scope interpretation as I have proposed for *pisi*.

(37) *Asunta mikhu-ra-n [[sapa irqi-q* **huk t'anta** *ranti-sqa-n]]-ta*
Asunta eat-PAST-3sg each/every child-GEN one bread buy-NM-3sg-ACC
'Each child bought one roll and Asunta ate it (the one bread bought per child).'

Note that (37) does not mean 'Asunta ate one roll that each child bought' (even on the reading where 'each child' seems to escape the relative clause to gain scope over 'one roll'[15]) because it contains the information that each child bought exactly one roll. Furthermore, although further investigation is necessary to thoroughly explore this construction, (37) raised no problems for my Quechua consultants, while some English consultants find the sentence "Asunta ate the one roll that each child bought," to be understandable with the meaning indicated above, but to be semantically odd and/or difficult to parse.[16] Other consultants find it understandable only with the unlikely

[13] That such restrictions do exist is clear. For instance, for a non-head universally quantified DP within an IHR, the scope of the quantifier is clause-bound, as in the following example, from the personal narrative of Gregorio Condori Mamani [Valderrama & Escalante 1977 p.33]

...tapu-ra-nku [[papel lliw movilizable-man qo-sqa-nku]]-manta
ask-PAST-3pl [[paper all "mobilized_soldiers"-DAT give-NM-3pl]]-ABL
'They asked for the paper that they gave to all "mobilized soldiers".'

Here, the universally quantified DP *lliw movilizable* 'all mobilized soldiers', not being the head of the RC, is clearly clause-bound.

[14] Consider, for instance, examples (18) and (19). Since *wakin* 'some' is strong in Quechua, these sentences mean something like "Some of the houses that Juan's father built are big," and not "Juan's father built some of the houses and they are big." On the other hand, the same sentences with the number *kinsa* 'three', a weak quantifier, in place of *wakin* mean "Juan's father made three houses and they are big." In this case, he made exactly three, and they are all big. These interpretations are in line with the strong and weak quantifier positions suggested by *pisi* and *tukuy*.

[15] Abusch [1994] notes that English *each* does seem to have this clause-escaping property, and this may also be true of Quechua *sapa*, although if my theory is correct this sentence is not sufficient to demonstrate this. Further work is needed on the exact nature of *sapa*.

[16] Sharvit [1996] explores acceptable English sentences with (externally-headed) relative clauses resembling the IHR in (37). She advocates a functional analysis of the so-called "multiple individual reading" of sentences such as:

reading that there is only one roll which was bought individually by each child. In the Quechua sentence, if we were to imagine that the head *huk t'anta* undergoes LF raising, and then for some reason is obligatorily associated with a null definite determiner (this is the analysis which I argue against in Section 4) we would expect (37) to run into the same problem as is found in the English version. On the other hand, an E-type anaphora analysis allows us to interpret first the relative clause 'each child bought one roll', and then the matrix clause: Asunta ate the maximal entity which is rolls bought by the children.

5.3 *Interaction With Distributivity*

Further evidence for the close relationship between the head of a relative clause and the embedded verb suggested by the E-type anaphora analysis is provided by data involving the distributive[17] suffix *-nka* (studied in detail in [Faller 2001]). This suffix typically appears on either the noun or the quantifier of certain quantified DPs (its acceptability depending on the quantifier). In this section I will first summarize the relevant uses and distribution of *-nka*, then show how *-nka* interacts with relative clauses.

Examples (38) to (41) illustrate the compatibility and interpretation of *-nka* with various DP types.

First, *-nka* is compatible with the weak quantifiers *pisi* 'few/a little', *ashka* 'many/a lot' and *huk* 'one' (and other numbers). In its distributive use, it marks the DP which is being distributed.[18] It indicates that the marked DP will be distributed in units of the size specified by the quantifier. Examples with *ashka* 'a lot' (38) and *iskay* 'two' (39) are shown below. The suffix *-nka* can optionally surface on the quantifier or on its sister noun.

(38) *Runa-kuna-man-qa* *ashka-nka* *coca-cha-ta* *qo-yku-nki.*
person-plural-DAT-TOP much-**nka** coca-DIMIN-ACC give-intensifier-2sg(fut.)
'You will give a lot of coca (leaves) to each person.'

(39) *Pisi* *runa* *iskay* *wik'uña-nka* *riku-ra-nku.*
a few person two vicuña-**nka** see-PAST-PL
'A few people saw two vicuñas each.'

However, *-nka* may not appear on nominals quantified with the strong quantifiers *tukuy* or *wakin* (as in (40)), or on the bare noun *cocacha* 'coca leaves' in (41).[19]

(40) **Runa-kuna-man-qa* *wakin coca-cha-nka-(ta)* *qo-yku-nki.*
person-PL-DAT-TOP some coca-dimin-**nka**-(ACC) give-intensifier-2sg.fut
'You will give some of the coca leaves to each person.'

(41) **Runa-kuna-man-qa* *coca-cha-nka-(ta)* *qo-yku-nki.*
person-PL-DAT-TOP coca-DIMIN-**nka**-(ACC.) give-intensifier-2sg.fut
'You will give coca leaves to each person.'

Now we may ask whether the head of a relative clause can be marked with distributive *-nka*. Note that the incompatibility of this use of *-nka* with strong quantifiers makes the question only relevant to weakly quantified heads.

I find that *-nka* may only appear on the head of an IHR when the subordinate verb supports a distributive interpretation with respect to that head. For example, sentences (42) and (43) illustrate IHRs in which the head is marked by the distributive use of *-nka*.

(42) *[[***Huk platanu-nka** *ranti-sqa-y]]-ta* *tukuy* *llama* *mikhu-ra-nku.*
one banana-**nka** buy-NM-1SG-ACC all llama eat-PAST-PL
'I bought one banana each (per llama) and all the llamas ate them.'

(43) *[[Juan-pa* **iskay wik'uña-(*nka)** *muna-sqa-n]]-ta* *pisi* *runa* *riku-ra-nku.*
Juan-GEN two vicuña-**nka** like-NM-3sg-ACC a few person see-PAST-PL
'Juan likes two vicuñas and a few people saw them.'

Note that in (42), 'buy' is compatible with a distributive interpretation, and in fact speakers report that the sentence conveys that I had (deliberately) bought enough bananas so there would be one per llama. The embedded verb 'like' in (43) is incompatible with such an interpretation.[20] Therefore this sentence is acceptable only if the suffix *-nka* is omitted.

Note that these results are surprising under any analysis in which the head of the IHR raises at LF to a position in which it is external to the relative clause. For example, in the English sentence 'A few people saw two vicuñas that Juan likes' there is no problem distributing pairs of vicuñas over people. However, an analysis such as the one I have outlined in the preceding sections in which an IHR is interpreted as a sentence would predict that the distributive nature of *-nka* must be compatible with this subordinate clause.

There remains one mystery, which I will leave to further research. It appears that there is some level of incompatibility between an *external* head and the suffix *-nka*. For example, the EHR version of (42) is unacceptable, as seen in (44).

(44) **[[Ranti-sqa-y]* **huk platanu-nka***](-ta)* *tukuy* *llama* *mikhu-ra-nku.*
buy-NM-1SG one banana-**nka**-ACC all llama eat-PAST-PL
'I bought one banana each (per llama) and all the llamas ate them.'

The woman every man invited to the party was his mother. [Sharvit 1996, p.3]

(The relevant readings are those in which with the woman varies with the man.) Rejecting analyses in which *every man* escapes its clause to take matrix scope, Sharvit argues that this effect is achieved because the operator trace in the RC is interpreted as a function variable (of type <e,e>). Because Sharvit's analysis relies on the presence of operator movement and not head-raising, it is not immediately applicable to the case of Quechua IHRs. Furthermore, since there is no definite marking on *huk*, a functional analysis would not explain the unavailability of the reading in which each child bought several rolls and Asunta ate one roll from each child's stash. These considerations lead me to conclude that the E-type anaphora analysis is the correct one for Quechua. I leave possible connections between Sharvit's work and the apparent clause-escaping properties of universally quantified heads to future research.

[17]This is the traditional description of this suffix, but Faller [2001] gives evidence that in fact it serves a more complicated function than simple distributivity, and at least in some uses seem to take on a group-forming function.

[18]This DP is called the Distributive Share in the terminology of [Choe 1987].

[19]It is not the case that *-nka* is always incompatible with strong quantifiers, however. In the following example, *-nka* appears twice, and in *sapa-nka irqi* 'each-nka child', it is associated with the strong quantifier *sapa*. Here, the role of *-nka* can be seen as group-forming, while the second use marks the Distributive Share.

Sapa-nka *irqi* *pisqa* *t'anta-nka* *mikhu-nqa-ku.*
Each-**nka** child five bread-**nka** eat-FUT-PL
'Each child will eat five rolls.'

For the purposes of this paper, however, I concentrate on the simple distributive use of this suffix.

[20]One consultant did suggest that (43) could possibly be acceptable with *-nka* under a reading in which Juan likes vicuñas in pairs. This is consistent with the group-forming uses of *-nka* discussed in Faller [2001].

Sentence (44) is simply not understandable to my Quechua consultants, and in fact the distinction between the acceptable IHR sentence (42) and the unacceptable EHR sentence (44) is the only truth-conditional contrast I have found between EHR and IHR pairs.

6 Conclusion

In this paper I have shown that the meaning of Quechua relative clauses is not captured by previously proposed relative clause interpretation schemes. Specifically, I have shown that the position in which the head of a relative clause is interpreted depends on the quantifier associated with that head. I have drawn contrasts with Japanese, in which the surface position of the head determines its interpretive position. These facts have led me to propose that while relative clauses with head marked by *pisi* 'a little' are amenable to an E-type anaphora analysis, those whose head is marked by *tukuy* 'all' appear to involve head-raising. In this second class of relative clause, the universal quantifier is apparently interpreted outside of its clause at LF.

These findings are in general support of the idea expressed in [Basilico 1996], [Hoshi 1995], [Shimoyama 1999] and others that relativization is not achieved cross-linguistically by a single syntactic structure. Although my proposal contradicts predictions of [Williamson 1987] and [Culy 1990] since I have found universally quantified internal heads in Quechua, the data nonetheless supports the more general point made by Williamson and Culy, that strong and weak DPs behave differently as the head of a relative clause. In Quechua, both types of internal heads are allowed, but the semantic patterns exhibited by the two are quite distinct.

These results suggest that internally headed relative clauses are more cross-linguistically diverse than has previously been suggested, and analyses proposing uniform syntactic and semantic structures for all IHR languages are inadequate. This diversity in turn suggests that further research into the detailed semantics of relative clauses across languages is called for in order to establish a more comprehensive typology of internally headed relatives.

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