Patterns of relative clauses

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1   Introduction

For most (western) linguists a typical example of a relative clause would be like the following example:

(1)   Please hand this over to **the man** _who_ is wearing a red jacket.

Here *the man* is a definite nominal antecedent, *who* a relative pronoun (referring to the antecedent), and *who is wearing a red jacket* a restrictive relative clause, where the relative pronoun plays the role of the subject.

However, cross-linguistically – but also language-internally – there are many types of relative clauses. In this article I intend to discuss the range of possibilities and present a coherent classification. In the last section I try to indicate briefly what the consequences of the amazing number of variations are for the grammar.

First, let us establish what can be called a relative clause. Definitions that make use of the concepts *modification* or *antecedent* are obviously to narrow, since there are appositive relatives, head-internal relatives, etc. (see further). Thus consider the definition in (2), which is both semantic and syntactic.

(2)   *defining properties of relative clauses*
       i)   A relative clause is subordinated.[1]
       ii)   A relative clause is connected to surrounding material by a pivot constituent.

The pivot is a constituent semantically shared by the matrix clause and the relative clause. Often it is a noun phrase. If it appears to be spelled out inside the matrix clause, it can be recognized as an antecedent. This yields [$_{matrix}$ … [N RC] …], where the relative clause contains a gap (which may be filled by a relative pronoun). If the pivot is spelled out inside the relative clause, the construction is

head internal: [$_{matrix}$ …[$_{RC}$ …NP ..] ..]. In this case the matrix contains the gap, which is filled by the whole relative construction (as sketched),[2] or – if RC is preposed – by a demonstrative (a correlative construction). In my view, variation concerning the position and content of the gap is expected, since there are different strategies to cope with the dimensionality problem that (2ii) poses (i.e. the pivot must be in two sentences at once) – considering the fact that every linguistic construction must be linearized. If this were not so, no gap would be needed at all.

There is a third universal property of relative clauses. Although it may not be a defining property, it is essential in the sense that the whole concept of relativization would be rather limited in use if it were invalid.

(3)   *additional essential property of relative clauses*
       The semantic θ-role and syntactic role that the pivot constituent has in the relative clause, are in principle independent of its roles in the matrix clause.

This is briefly illustrated in (4). *Mouse* is the pivot NP. It is experiencer in the main clause and patient in the relative. Syntactically, it is subject in the main clause and direct object in the subordinate.

(4)   The mouse that I caught _ yesterday was hungry.

Hence the gap in the relative representing the mouse is both semantically and syntactically independent of its roles in the main clause. This does not mean that every role is available in every language. Languages can restrict the number of available internal roles, i.e. they can be scaled differently on a *grammatical function hierarchy* (cf. Keenan & Comrie, 1977; Lehmann, 1984:219, Bakker & Hengeveld, forthcoming). For instance, in many languages prepositional objects and lower functions are not possible relative positions. There are also language-dependent constraints that have to do with the possibility of recovering the function of the relative 'gap' (see e.g. Givón 1984:Ch15). Furthermore, in free relatives the number of roles can be restricted by Case matching effects (e.g. Groos & Van Riemsdijk 1981). Nevertheless, these limitations do not fundamentally alter the role *independency* stated in (3).

2   Parametric variation

2.1   Overview of differences

Differences between relative clauses can be found on any imaginable aspect of the construction. See the chart in (5).[3] It is based on the sample of patterns

described in De Vries (in prep.) that consists of 231 relative strategies in 176 languages around the world. They are compiled from typological data in Comrie (1981), Culy (1990), Downing (1978), Givón (1984), Keenan (1985), Keenan & Comrie (1977), Lehmann (1984), Peranteau et al. (1972), and Smits (1988).

(5) a. *kind of modification/relation:*   restrictive, appositive, degree
     b. *hierarchical status of RC:*   embedded within DP, correlative
     c. *presence of head:*   headed/free relatives
     d. *presence of relative pronoun:*   yes/no
     e. *presence of complementizer:*   yes/no
     f. *presence of resumptive pronoun:*   yes/no
     g. *hierarchical position of head:*   externally/internally headed RCs
     h. *linear order of head and RC:*   head initial/final relatives
     i. *inflectional completeness of RC:*   finite/participial relatives
     j. *position of Det w.r.t. N and RC:*   initial/middle/final
     k. *position of (Case) markers, if any:*   on N, on N *and* RC

Hence, theoretically, there might be $3^2 \text{x} 2^9 = 4608$ types of relative clauses. Clearly, this estimate is a little exaggerated, since there are correlations between the parameters mentioned.

I will briefly illustrate the contrasts mentioned in (5) by example sentences (6) through (16).[4]

(6) *kind of modification/relation:*
     a. (Jill spoke to) the lecturers that failed the test on didactics.   *[restrictive]*
     b. (Jill spoke to) the lecturers, who failed the test on didactics.   *[appositive]*
     c. (Jill spilled) the milk that there was in the can.   *[degree relative]*

(7) *hierarchical status of RC:*
     a. [$_{DP}$ The [boys who are standing]] are tall.   *[embedded within DP]*
     b. [$_{CP}$ Jo laRke KhaRe hai], ve   lambe haiN.   *[correlative]*
             wh boys   standing are those   tall   are   (Hindi)
         lit. 'Which boys are standing, they are tall.'
         'The boys who are standing are tall.'

(8) *presence/absence of head:*
     a. Jill liked the **present** which I gave to her.   *[headed relative]*
     b. Jill liked what I gave to her.   *[free relative]*

(9) *presence/absence of relative pronoun:*
     a. Jill visited the museum **which** I recommended.
     b. Jill visited the museum I recommended.

(10) *presence/absence of complementizer:*
    a.   Jill visited the museum **that** I recommended.
    b.   Jill visited the museum I recommended.

(11) *presence/absence of resumptive pronoun:*[5]
    a.   ha-isha   she-Yoav ohev **ot-a** …   (Israeli Hebrew)
        the-woman REL-Yoav loves   ACC-her
    b.   'the woman that Yoav loves …'

(12) *hierarchical position of head:*[6]   (Ancash Quechua)
    a.   [Nuna **bestya-ta** ranti-shqa-n] alli bestya-m ka-rqo-n.   *[IHRC]*
        man   horse-ACC buy-PERF-3 good horse-EVID be-PAST-3
    b.   'The **horse** that the man bought was a good horse.'   *[EHRC]*

(13) *linear order of head and RC:*   (Mandarin Chinese)
    a.   Wǒ bǎ [nǐ gěi wǒ de] **shū** diūdiào-le.   *[prenominal RC]*
        I   ACC you give I   NR   book   loose-PERF
    b.   'I have lost the **book** [you gave me].'   *[postnominal RC]*

(14) *inflectional completeness of RC:*   (Telugu)
    a.   [Mīru nāku ic-cin-a]   pustukamu cirigipŏ-yin-adi. *[participial RC]*
        you$_{pl}$ me give-PRET-PART book$_{nom}$ tear.up-PRET-3.SG
    b.   'The book you gave me has been torn up.'   *[finite RC]*

(15) *position of determiner with respect to N and RC [initial, middle, final]:*
    a.   I   spoke with **the** *man* <u>who   knows you</u>.
    b.   Jag talade med *mann*-**en** <u>vilken känner dig</u>. [=a.]   (Swedish)
    c.   Dia menulis *buku* <u>yang tebal</u> **itu**.   (Indonesian)
        he   ACT-write book REL   thick DEF
        'He wrote the book which is thick.'

(16) *position of (Case) markers, if any:*
    a.   Ich fürchte den Herr-**n**   der eine Pistole trägt.   *[on N]*
        I fear the gentleman-ACC who a   gun   carries   (German)
    b.   …tu"ku- **i** [u^{n} t**i** "ka-"pih]-**a**.   *[on N and RC]*
        …meat- ACC [POSS.3   eat-PART.PERF]-ACC   (Shoshoni)
        '…the meat that he ate.'

I cannot possibly treat all these differences in detail here, but I will highlight several aspects of the classification of relative clauses in the next sections.

2.2 *Main types of relative clauses*

There are four main types of relatives. They are sketched in (17).

(17) a.   postnominal relatives $[_{\text{S-matrix}} …[\text{N RC}] ..]$
    b.   prenominal relatives $[_{\text{S-matrix}} …[\text{RC N}] ..]$
    c.   circumnominal relatives $[_{\text{S-matrix}} …[[_{\text{RC}} …\text{N} ..]] ..]$
    d.   correlatives $[_{\text{S-matrix}} [_{\text{RC (…)}} \text{N} ..] [_{\text{S-matrix}} …(\text{Dem}) ..]$

Each type has a headed and a free variant, which has been shown for postnominal relatives in (8) above. This is exemplified extensively in Lehmann (1984), and I will not repeat it here. Some important absolute and scalar differences between the four types are summarized in tables 1 and 2.

Table 1.   Absolute properties of relative clause types.

property	*postnominal*	*prenominal*	*circumnominal*	*correlative*
internal head	no	no	yes	yes
nominalized	yes	yes	yes	no

As illustrated in (7) and (12) above, circumnominal relatives and correlatives have an internal head. The former type is nominalized, i.e. it is a DP (see e.g. Culy 1990) – hence there can be an external Case marker or determiner. Thus only correlatives are bare sentences, which are almost always left-adjoined to the matrix clause.

Table 2.   Scalar properties of relative clause types (based on Lehmann 1984).

scale	*prenominal*	*circumnominal*	*postnominal*	*correlative*
nominalization phenomena[7]	strong $\leftarrow$	medium	$\leftarrow$	weak
relative elements	gap $\rightarrow$ relative affix $\rightarrow$ relative particle $\rightarrow$ rel./demonstr. pronoun			

Prenominal relatives show strong nominalization phenomena: often there is a nominalizing affix, there can be temporal and modal limitations, etc. – cf. (14) above. This is much less so for correlatives. Concerning relative elements: correlatives preferably use a relative pronoun, whereas this is in fact impossible for prenominal relatives that are usually on the other end of the scale. See further section 2.5.

    Although postnominal relatives are the most common, the other types occur in different language families across the world. See figure 1, which is based on the sample in De Vries (in prep.) mentioned above.

Figure 1. *Relative clauses around the world.* Dot = postnominal; backslash = prenominal; circle = circumnominal; square = correlative.

2.3 The semantics of relative clauses

The semantics of relative clauses is treated insightful in Grosu & Landman (1998). By and large, relative constructions can be put on a scale that weighs the importance of external and internal material for the meaning of the whole construction. See table 3.

Table 3.   Semantic types of relative clauses: Grosu & Landman's scale.

property ↓	*semantic type* →	*sortal-external*		*sortal-internal*
		appositives → restrictives →		maximalizers
stacking		yes		no
determiners		all types		only definite and universal

For instance, the head noun and the relative modifiying clause are equally important to determine the meaning of a restrictive relative. In a maximalizing construction – e.g. the degree relative in (6) – the relative IP is essential for the meaning, partly because of a semantic maximalization operation (hence the name). This can be detected easily by testing stacking and determiner possibilities. This is shown in (18) and (19) for English postnominal relatives, where the presence of *there* forces a degree reading.

(18) a.   I liked {the/every/*a/*any} dog(s) that there was/were in the cage.   [max.]
      b.   I liked {the/every/a/any} dog(s) that was/were in the cage.   [restr.]

(19) a. * I liked the dogs that there were in the cage, that there were in the garden yesterday.   [max.]
      b.   I liked the dogs that were in the cage, that were in the garden yesterday. [restr.]

I cannot possibly repeat all combinations here, but the results of my search (partly from Grosu & Landman) are summarized in table 4. A plus means that the combination exists; a minus that it does not.

Table 4.   Mapping between syntactic and semantic types of relative clauses.

syntactic type ↓	*semantic type* →	appositive	restrictive	maximalizing
postnominal		+	+	+
prenominal[8]		-	+	+
circumnominal[9]		-	+	+
correlative[10]		-	-	+
free relatives[11]		-	-	+

Here, free relatives can be of any main type (postN, preN, cirN, correlative).

2.4　Word order variation

In (15) above, I illustrated that the linear order between head noun, determiner and relative clause varies with language. In fact, all logically possible permutations are attested. The results are summarized in table 5.

Table 5.　The linear order of D, N and RC in adnominal restrictive relatives.

RC type	*linear order*			*language examples*	
				OV languages	*VO languages*
postnominal	D	N	RC	Dutch	English
	N	D	RC	Oromo	Swedish
	N	RC	D	Lakota	Indonesian
prenominal	D	RC	N	Tigré	(RC N: Palauan, Chinese)
	RC	D	N	Korean	
	RC	N	D	Basque	

I do not have clear examples of prenominal relatives in VO languages that have an overt determiner. (I have left VSO and OVS patterns out of consideration.)

2.5　Relative elements

Last but not least, there is a tremendous variation in the use of relative elements. Lehmann (1984:249) classifies them with respect to three functions: Subordination, Attribution (of the relative to the head) – which can be detected by the presence of agreeing ɸ-features – and Gap construction, which indicates whether the relative element occupies the relative gap. I revised this classification in De Vries (in prep.). The results are in table 6, where I indicated how the three functions translate into syntactic characteristics.

Table 6.　Relative pronouns and particles (theoretical version).

Function/ feature ↓　　Type →	*relative pronouns*	*relative particles*		*resumptive pronouns*
		relative complementizers	*relative markers*	
Subordination	-	yes	-	-
Attribution	yes	-	yes	-
Gap construction	yes	-	-	yes
categorial type	D	C	D	D
ɸ-features	+	-	+	+
Case	+ (sub)	-	+ (matrix)	+ (sub)
wh movement	+	-	- (?)	
sentence-initial position	+	+	+	-

On the basis of the actual language sample we can provide a more fine-grained classification of relative elements. This is shown in table 7 (explanation below). There turns out to be a large diffuse class of 'relative affixes' that has received no theoretical attention until now, as far as I know. (This is why they are not in table 6.)

Table 7. A fine-grained classification of relative elements.

relative pronouns	relative particles			resumptive pronouns
	relative complementizers	relative markers	relative affixes	
RP_d RP_{wh} RP_{sp}	RC_{SR} RC_{sp} RC_{NR} RC_{AT}	RM RM_{CL}	RA(Agr)　RA(T) RA(AT)　RA(SR) RA(CL)　RA(add) $RA(NR_{T/add})$	GD GA

RP_d A relative pronoun in *d*-format, i.e. with only a *demonstrative* core. Example: Danish *den*, Dutch *die*.

RP_{wh} A relative pronoun in *wh*-format, i.e. with an *interrogative* morpheme (apart from a possible demonstrative morpheme). Examples: English *who*, Serbo-Croatian *koje*, Latin *quis*.

RP_{sp} A relative pronoun in a *specialized* format, or at least with a specialized morpheme (next to a possible *wh*- and/or *d*-morpheme). Examples: Hindi *jo*, Slovenian *kdòr*.

RC_{SR} A relative subordinator equals another complementizer. Examples: English *that*, Norwegian *som*, Farsi *ke*.

RC_{sp} A particle specialized for relative clauses. Examples: Czech *co*, Indonesian *yang*.

RC_{NR} A general nominalizing particle also used for relatives. Example: Mandarin Chinese *de*. Similar examples are from Burmese and Lahu.[12]

RC_{AT} A general attributive particle also used for relatives. The only example I have is Akkadian *ša*.

RM   Relative markers in non-classifier languages. Example: classical Arabic *al-la-ḏ ī*.

RM_{CL} Relative markers that are classifiers, sometimes with an additional *d*-morpheme. Examples: Hungana *wi, ki, yi*, Wolof *g-u*, etc.

RA(Agr)   A specialized relative agreement affix that replaces subject or object agreement on the verb in a relative clause, e.g. in Hopi or Kongo.

RA(T)   A specialized relative temporal affix that replaces T on V, for example in Greenlandic or Tamil. This turns the relative into a participial relative, except in Korean, where there are specialized relative temporal affixes for different tenses. Notice that there are prenominal *and* postnominal participial relatives. The latter type (e.g. in Cahuilla, Greenlandic or Ojibwa) occurs less frequently than the former (e.g. in Tamil or Turkish).

RA(NR)   A nominalizing affix. (Compare RC_{NR} above.) It can replace a temporal affix – $RA(NR_T)$, e.g. in Ancash Quechua or Tibetan – which leads to a participial relative; or it can be additional: $RA(NR_{add})$, e.g. in Japanese or Navaho. In some languages a nominalizer provides information on the Case role of the relative gap, e.g. there are subject and object nominalizing affixes in Turkish.

RA(AT)   An (additional) attributive affix. (Compare RC_{AT} above.) There is one example, from Mbama.

RA(SR)   An (additional) subordinating affix. (Compare RC$_{SR}$ above.) For example in Amharic or Ganda.

RA(CL)   An (additional) relative classifier affix that agrees with the head noun. (Compare RM$_{CL}$ above.) For example in Bora or Swahili.

RA(add) A specialized additional relative affix, e.g. in Hopi, Kongo or Yaqui.

GD   A resumptive pronoun that is a full pronoun, e.g. in Diegueño, or Urhobo.

GA   A resumptive pronoun in clitic/affix form, e.g. in Ganda or Welsh.

Table 8 summarizes which relative elements occur in which main types of relatives. Very roughly, table 8 is in accordance with table 2 above.

Table 8.   Relative elements in relative clause main types.

RC type↓	relative element→	relative pronoun	relative compl.	relative marker	relative affix	res. pron.	[nothing]
postnominal		+	+	+	+	+	+
prenominal		-	- (+)[13]	-	+	- (+)[14]	+
circumnominal		-	- (+)[15]	-	+	-	+
correlative		+	- (+)[16]	-	- (+)[17]	-	+

Finally, it is of interest to see which relative elements can be combined. I have found the following; see table 9. (I also indicated the number of patterns found, but note that the figures are not corrected for a balanced division between different language families.)

Table 9.   Combinations of relative elements.

	relative pronoun	rel. compl.	relative marker	relative affix
resumptive pronoun	- [theoretically impossible]	+ 17 (Akan, Farsi, Urhobo, …)	+3 (Cl. Arabic, Geez, Hungana)	+4 (Jacaltec, Kongo, Shona, Swahili)
rel. affix	+1 (Hurric)	-	-	
rel. marker	-	-		
rel. compl.	+2 (Tun. Arabic, Hungarian)[18]			

It appears that relative pronouns and particles are hardly ever used in combination with each other, probably because it is unnecessary to mark a clause as a relative clause twice. However, resumptive pronouns are often used in combination with another relative element. This is not surprising, since marking of a relative clause is a reasonable strategy – in fact the predominant one – and a resumptive pronoun as such does not do so.

3 General discussion

I have shown that the typology of relative clauses is rather complex. This raises significant difficulties for a (syntactic) theory of relative clauses. It must be able to generalize over many different forms, and at the same time explain how the possible differences between and within languages can be derived.[19] It is clear that the so-called standard analysis (but in fact there are may variants of it) – which has been designed on the basis of postnominal D N RC relatives in VO languages (read: English) – is unsuited for the task in its present form.

Consider the four main types of relatives. The head-internal nature of correlatives and circumnominal relatives is strange in the light of the standard analysis, which includes complementation of a relative clause to (a projection of) N. On the contrary, the promotion analysis of relative clauses (described in Kayne 1994, Bianchi 1999, and my own work) naturally generalizes over these types, since the head is always internal; the differences are reduced to two simple parameters: i) overt or covert head raising, and ii) nominalization of the relative.[20]

Within a relative clause there is a division of labour between the complementizer C and the *wh*-raised determiner phrase with head D_{rel} in SpecCP: C expresses Subordination, and D_{rel} (with its ϕ and Case features) expresses Attribution, and possibly Gap Construction (cf. table 6). It seems that D_{rel} and C are always present, but they can each be overt or covert, depending on the language in question. Again, an approach along these lines generalizes over several types and reduces the differences to overt/covert distinctions.[21]

The most challenging part for a theory on relatives is the word order variation discussed in section 2.4. Clearly, this is dependent on the general theory of phrase structure one assumes. In my view, a theory must not only be able to represent a certain structure, but also be able to derive it in a plausible way. In De Vries (in prep.) I try to evaluate many possible theories. It seems possible to exclude many (sub)theories because they cannot plausibly derive one or more of the variants discussed. Thus a typologically rich data set of possible variants of a grammatical construction is not solely problematic, but it enables one to choose between various theoretical options.

Notes

[1] Correlatives are one level less deeply embedded than nominalized relative constructions. (For these cases, see section 4.) They are subordinated to the matrix clause, hence – in this respect – comparable to adverbial clauses such as *[because …]*.

[2] The relative clause is then nominalized (hence type-lifted). This yields a circumnominal relative. See further.

[3]   Abbreviations used (mainly in the glosses) are:

RC	= relative clause	IHRC	= internally headed RC	EHRC	= externally headed RC
SG	= singular	ACC	= accusative Case	NOM	= nominative Case
PRET	= preterite tense	PART	= participle	PERF	= perfect tense
EVID	= evidential	NR	= nominalizing particle	REL	= relative element
Det	= determiner	ACT	= active	DEF	= definite

[4]   Example (7b) is from Grosu & Landman (1998:164), (11a) from Givón (1984:655), (12a) from Cole (1987:277), (13a) from Lehmann (1984:64), (14a) from Lehmann (1984:50), (15c) from Lehmann (1984:95), (16b) from Lehmann (1984:79).

[5]   I am using the English example as a translation and a contrasting pattern at once.

[6]   I will refer to internally headed relatives as *circumnominal* relatives from now on, because correlatives are also internally headed.

[7]   These are (in increasing order): limitations in sentence type (illocutional) → modal limitations → temporal/aspectual limitations → implicit subject → infinite verb form → genitive (oblique) subject → limitations in possible complements.

[8]   Prenominal appositive relatives are marginal at best. Lehmann (1984:277/8) states that they are probably restricted to proper names. In Basque they are preferably postposed. Turkish uses a postnominal or extraposed (finite) variant especially for appositives. In De Vries (2000) I predicted that they cannot exist, if I am correct that apposition is specifying coordination. This can be maintained if what seem to be appositive prenominal RCs are really free relatives followed by a specifying name, comparable to e.g. *[she who is our director], (viz.) Jill...* See further De Vries (in prep.).

[9]   Appositive circumnominal RCs are marginal, too. Lehmann (1984: 278) states that they do not occur, except that there are examples from Mohave; but these always have a sentence-initial head noun, which makes them suspect. The same is the case for the rare examples Culy (1990:251-254,256) provides for Dogon and Japanese. Again, given the idea that apposition is specifying coordination, it follows that appositives cannot be circumnominal.

[10]   Grosu & Landman (1998) explain why correlatives must be maximalizing. Lehmann's (1984:279) examples of would-be correlative appositive free relatives are parenthetical sentences in my view. For instance, they can be interjected at any position in the sentence. This would not be possible if they were true correlatives.

[11]   Both realis and irrealis free relatives are maximalizing, although they have a different distribution. See Grosu & Landman (1998) for comment.

[12]   These particles are clause-final, contrary to all other relative complementizers (except in Oromo); therefore their classification as relative complementizers is tentative.

[13]   Exceptions: perhaps the clause final nominalizing particles in Burmese, Chinese and Lahu, and the clause-final particle in Oromo.

[14]   Exception: Chinese.

[15]   Exception: Dagbani.

[16]   Exceptions: Gaididj and Warlpiri.

[17]   Exception: Hurric.

[18]   Apart from these two, the combination of a relative pronoun with a relative complementizer is attested in many dialects of Germanic languages. However this is not the case in standard Dutch, German, English, etc. which is the reason why they are absent in the tables.

[19]   Just for clarity: I am not after a 'relative transformation' of some kind. Obviously, a theory of relatives must be decomposed in more general submechanisms. The question then arises if it is useful at all to speak about relative clauses in general. The fact that several syntactic structures lead to equal (or similar) semantic representations indicates that this is indeed the case.

[20] With respect to the D-complement hypothesis – i.e. the idea that the relative CP is selected by an external determiner (if the relative contruction is nominalized of course) – which is often assumed in combination with head raising, one may notice that this structure is directly visible in circumnominal relative constructions with an overt determiner (cf. Culy 1990).

[21] Next to this, I think that differences in pied piping possibilities are responsible for differences between languages and for different strategies within one language.

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