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Relativization in Dàgáárè and its typological implications:
Left-headed but internally-headed

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Abstract

This article examines in detail the syntax of relativization in Dàgáárè, a Mabia (Oti-Volta) language of the Gur branch in the Niger-Congo family. The main aims of our investigation are twofold. The first is to describe a cluster of typologically interesting syntactic features of relativization in Dàgáárè in the light of the fact that no detailed description exists in the literature. The second is to demonstrate that relative clauses in Dàgáárè are head-internal relative clauses (HIRCs), even though they are, on the surface, postnominal relative clauses, like those in English. Thus, they are not of the in-situ type of HIRC that is well known in the literature. We call this type of relative clause a left-headed HIRC. This type of relativization has rarely been noticed cross-linguistically in the previous literature and therefore is of considerable significance for general linguistics, linguistic typology, as well as theoretical linguistics. Evidence comes from coordination in possessor relativization and PP relativization. Our discovery shows that Universal Grammar allows left-headed HIRCs as an option in addition to the more familiar types: in-situ HIRCs and head-external relative clauses (HERCs).

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1. Introduction: varieties of relative clauses

The syntactic structure of relative clauses is an old but significant issue in linguistic theory. Chomsky (1977) proposed that relative clauses have an adjunction structure, as shown in the structure in (1a), (see also Jackendoff, 1972; Stockwell et al., 1973; Chomsky, 1977, 1995; Cinque, 1982; Lebeaux, 1990; Borsley, 1997; Sag, 1997, among others. See also Platzack, 2000 for “complement-of-N0” analysis of relative clauses). In this analysis, the relativized head noun is base-generated outside a relative clause and it is linked to the null operator that moves from the original position to [Spec, CP]. On the other hand, as shown in the structure in (1b), Vergnaud (1974) proposed that the relativized head of a relative clause raises from its original position to the left-peripheral position (see also Smith,

Kayne (1994) and others have proposed a raising analysis of relative clauses in English, roughly comparable to the one in (1b).

English relative clauses are, as is well known, postnominal – left-headed, in our terms introduced momentarily. Generally, they are considered to be externally-headed (hereafter head-external relative clauses (HERCs)). Historically, the term “postnominal relative clause” also often meant HERCs automatically. However, this is not quite precise in a more refined syntactic theory, because there are two analytical possibilities when a relativized head noun appears at the left- periphery: it can be external or internal to the CP clause. In this article, we use the terms head-external and head-internal purely in structural terms. A relative clause is head-external, if its relativized head noun appears outside the CP projection. A relative clause is head-internal, if its relativized head noun appears inside the relative clause (i.e. CP). Therefore, an externally-headed structure can be either generated by raising or base-generated. In contrast, the term postnominal or left-headed refers to the linear position of a relativized head noun. Thus, left-headed means postnominal as opposed to prenominal without any structural commitment. Thus, both analyses in (1) have been proposed for left-headed relative clauses in English, but the adjunction analysis (1a) argues for externally-headedness, whereas the raising analysis (1b) internally-headedness.

Returning to Kayne’s raising analysis (1b), the structure that he proposed is left-headed but internally-headed. However, Bhatt (2002) convincingly argues for a hybrid raising analysis for English, whose structure is diagramed as in (3). In this derivation, the relativized noun first undergoes an A∗-movement (“raising”) to [Spec, CP], from which it further moves and adjoins to CP. Then, the relativized noun projects from there and it merges with the determiner. It is very important to notice that under his theory, English relative clauses are derived by raising but they are syntactically externally-headed with the head noun clearly outside CP (see also Iatridou et al., 2001; Cecchetto and Donati, 2008 for similar/related approaches). Hulsey and Sauerland (2006) reach yet another conclusion that English relative clauses are structurally ambiguous between head-external and head-internal structures.

(2) This is the book that John wrote.
Typologically, it is well known that there is another type of relative clauses called head-internal relative clauses (HIRCs) (Cole, 1987; Williamson, 1987; Basilico, 1996; Watanabe, 2004, among others). It is called ‘head-internal’ because the relativized head noun remains in its original position as shown in (4) (some researchers propose a null operator movement, while others posit a null pronoun in the external head position, a choice of which is immaterial here).

Basilico (1996), in his study on HIRCs, made an interesting and pertinent observation that in some languages, the relativized head noun at the left periphery is still located internally to the relative clause. The sentence (5a) is an example of an in-situ HIRC in Diegueño where the relativized head noun is wi:m ‘with the rock’ and appears in its original position. This relative clause has the structure in (4). In the example (5b), the head noun is moved to the left, leaving an obligatory resumptive pronoun in-situ. He argues that it is still located inside the relative clause, however. His evidence is based on the fact that in the example (5c), the relativized head noun is optionally moved leftward but it cannot receive the subject case-marker, which should be possible if the head noun were external to the clause. Instead, as shown in the grammatical example (5b), the relativized head noun must be zero-marked (i.e. marked with the object-marking). Thus, the case-marking shows that the fronted head noun is still internal to the relative clause, even though it appears at the left periphery. In other words, the example (5b) is an HIRC whose head noun does not remain in-situ. Let us call the relative clause in the example (5b) an ex-situ HIRC.

The Mesa Grande dialect of Diegueño (Basilico 1996, 501, 505)

a. [xatçok(-ﬁ) wi:m tuc-pu]-c nįL.ig. dog-Obj rock-Comit I.hit-Dem-Subj black
   ‘The rock that I hit the dog with was black.’ (In-situ HIRC)
b. [’wi:m xat(-ﬁ) nįL.ig-m tuc-pu]-c nįL.igenis. rock dog-Obj that-Comit I.hit-Dem-Subj black.Indeed
   ‘The rock that I hit the dog with was black.’ (Ex-situ HIRC)

1 The sentence (5a) is actually ambiguous and the other interpretation is ‘the dog that I hit with the rock was black’. However, the head-fronting in the relative clause (5b) disambiguates the sentence.
Basilico (1996) argues that the moved head noun in (5b) is adjoined to IP via scrambling. This is illustrated in the structure below.² He assumes that the determiner takes a IP/TP clause, but I indicate a CP as well (a head parameter is irrelevant in the following schematic structure). (6) Ex-situ HIRC (à la Basilico 1996)

In this article, we will argue that relative clauses in Dàgáàrè are also ex-situ HIRCs. However, we will demonstrate two significant properties: (i) the movement of the head in Dàgáàrè is obligatory (unlike Diegueño) and (ii) the head noun lands in the left-edge position, higher than TP—i.e. the edge of CP. This is shown in the structure (7). Thus, we will call the relative clause of this type left-headed HIRCs. Notice that the relativized head noun phrase, even though it appears at the left periphery, is still internal to the CP clause. In other words, left-headed HIRCs are a subtype of ex-situ HIRCs in that the head noun is displaced, but they crucially differ in its landing site – TP vs. CP. (7) Left-headed HIRC

² However, strictly speaking, he does not show evidence that it is adjoined to IP, not, for example, CP.

It should be emphasized that it is typologically significant to bring to light the existence of (7) in Dàgáàrè, because such data bridge a gap in the typology of HIRCs. One of the main aims of parametric syntax and typology is to uncover principles that define possible languages (see Baker, 2001). Typological studies in the past decades have discovered languages that allow only in-situ HIRCs (e.g. Lakhota, Navajo) as well as languages that allow both in-situ and left-headed HIRCs (e.g. Diegueño, Mojave, Japanese). The obvious missing paradigm is languages that only allow left-headed HIRCs. This type of language is indeed expected to exist if no other principles block the option. This is the gap that Dàgáàrè fills in.
Although movement of an internal head has been described in some detail before by Basilico (1996) and he analyzes it as optional scrambling, the obligatory left-fronted positioning of the head in Dágárāre is typologically not known yet. It should be noted that the left-headed HIRC pattern has also been observed in Yavapai (a Yuman language) by Kendall (1976), which was taken over in Lehmann (1984). Lehmann, however, judges the source as unreliable and no further investigation has been carried out. Therefore, confirmation of left-headed HIRCs with data from Dágárāre (a language unrelated to Native American languages) is of much typological significance.

A word of caution is in order here. The structure of left-headed HIRCs (7) is essentially quite similar to Kayne’s structure (1b). This might be a little confusing at first, since Kayne proposed the structure for English, whose relative clauses are assumed to be “externally-headed”. But as we have explained above, theoretically, the relative clause (1b) is indeed internally-headed (putting aside whether English has this structure or not). In this article, we assume the explicit syntactic criterion: the crucial structural difference between HIRCs and HERCs is that in the former, the external D takes a CP as its complement, whereas in the latter, it takes an NP as its complement. From this criterion, the structures (1b), (4), (6) and (7) are all internally-headed, while the structures (1a) and (3) are externally-headed.

The main aim of this article is to demonstrate that relative clauses in Dágárāre are always left-headed, but still internally-headed, as those in Diegueño and Mojave are. However, Dágárāre does not have subject-predicate agreement in most cases. Case-marking is also absent, unlike in Diegueño and Mojave. Thus, we will provide two pieces of novel evidence for left-headed HIRCs – PP relativization and possessor relativization and their interactions with coordination.

One of the crucial examples that we will focus on in this article is the following pairs of sentences in (8). In the example (8a), the complement noun of the P(ostposition) is relativized and appears at the left edge. In contrast, in the example (8b), the whole PP is pied-piped to the left edge. Building on coordination data, we will demonstrate that if relative clauses in Dágárāre are externally-headed and have the adjunction structure (1a), relevant data become mysterious.

(8) Relativization and pied-piping of P
   a. ń dâ dâ lá ̀ [l joyful ̀ ná], Dákóráá náng gâng ̀ ò [póó].
      1SG Pst buy.Perf F D car Dem Dákóráá C lie.Perf 3SG in
      ‘I bought the car in which Dákóráá slept.’ *I bought the inside of the car in which Dákóráá slept.’
   b. ń dâ dâ lá ̀ [l joyful ̀ ná póó], Dákóráá náng gâng ̀ t.
      1SG Pst buy.Perf F D car Dem in Dákóráá C lie.Perf
      ‘I bought the car in which Dákóráá slept.’ ‘I bought the inside of the car in which Dákóráá slept.’

The organization of this article is as follows: Section 2 describes significant features of relativization in Dágárāre, to lay ground for main discussions. Section 3 investigates the syntactic structures of two types of Dágárāre relativization – PP relativization and possessor relativization – in relation to coordination, and argues that Dágárāre relative clauses belong to what is called a left-headed HIRC in Hiraiwa (2005, 2008). Section 4 discusses typological implications. Section 5 concludes the article.

2. Elements of Dágárāre relativization

Dágárāre is a Mabia (Oti-Volta) language of the Gur branch of the Niger-Congo family and is spoken in the Upper-West region of Ghana. The language is spoken by approximately two million people. In this article, we will focus on the Jirapa dialect of Dágárāre, the major dialect, which is also known as the Central dialect. Most readers and books for schools are written in this dialect, and the so-called standard Dágárāre is based on it. The syntax and semantics of Dágárāre relativization has been little described except for brief discussions in Bodomo (1997, 2000). Therefore, we

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3 He warns in a footnote (p. 121) that the pattern could be an idiolectal property of an informant whose speech is influenced by English or Spanish, and states that Yavapai is the only known language so far with this property. We are grateful to an anonymous reviewer for bringing our attention to this fact.

4 Recall that Kayne’s “head-internal” structure (1b) is refuted for English relative clauses by Bhatt (2002) in favor of the “head-external” structure (3) after all. It is not our aim in this article to examine the syntactic structures of English relative clauses. See Hulsey and Sauerland (2006) for more discussions.

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aim to reveal the workings of relativization in Dágaáré. In so doing, it will become clear that Dágaáré relativization has much to contribute to general linguistics and theoretical linguistics. In particular, this article shows that Dágaáré has left-headed HIRC's, which are typologically almost unnoticed. Furthermore, our data show that a language can have left-headed HIRC's even though it does not allow in-situ HIRC's (or at least it allows very marginal in-situ HIRC's), in contrast with a language like Diegońeñu.

In this section, we will take a closer look at syntactic features of Dágaáré relativization. The first section focuses on the exterior syntax such as determiners, and the second section examines the interior syntax with special focus on preverbal particles, C and the subject position.

2.1. The exteriors

As the declarative sentence (9a) shows, Dágaáré is an SVO language with no null pronouns or overt agreement. It does not have scrambling and the word order can only be changed via A-movement (Wh-movement, focus-movement, or topicalization). Bodomo (1997, 2000) and Dakubu (2005) present detailed overviews of aspects of the grammar of Dágaáré. Many declarative root sentences have the postverbal declarative focus particle lá, behaviors of which are extremely complicated (see Dakubu, 1992; Bodomo, 1997, 2000; Hiraiwa and Bodomo, 2008 for some discussions). Dágaáré is an obligatory Wh-fronting language as shown in the Wh-Question (9b). Dislocated Wh-phrases are followed by the focus particle and the complementizer ka.5

Now let us examine relative clauses in (10) in detail.

(10) a. Subject relativization
    ñ nyé lá à pógó₁, ná e/*ò₁ náng nòng Dàkóráá
    1Sg see F D woman Dem φ/3Sg C like Dakoraa
    ‘I saw the woman who likes Dakoraa.’

b. Object relativization
    ñ nyé lá à pógó₁, ná Dàkóráá náng nòng e/*ò₁.
    1Sg see F D woman Dem Dakoraa C like φ/3Sg
    ‘I saw the woman who Dakoraa likes.’

In Dágaáré relativization, the head noun of the relative clause – indicated in boldface – comes in the initial (i.e. left-edge) position of the relative clause, just like Wh-phrases. The relativized head noun takes the definite determiner à and the distal demonstrative determiner ná. The deictic distal meaning of the latter, however, disappears in relativization, as in many other Gur /non-Gur languages, and this indicates that the demonstrative determiner in question has grammaticalized in some sense (cf. Kayne, 2008). In addition, the particle náng has to come before the verb. As we will show, this element is a complementizer. In Dágaáré relativization, there is always a gap with a systematic exception for relativization of possessors or objects of postpositions, where a resumptive possessive pronoun is required as we will see later. Otherwise, if a resumptive pronoun is used in the examples below, they are ungrammatical.

In Dágaáré, there seems to be no grammatical relational restriction on relativizable elements (see Keenan and Comrie, 1977). It is possible to relativize a possessor noun phrase in Dágaáré. It is most natural to leave the possessee

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5 The complementizer ka is obligatorily absent in root subject Wh-questions.
noun phrase in-situ with a resumptive possessive pronoun, but it is also grammatical to pied-pipe the entire noun phrase.\textsuperscript{6,7}

(11) Possessor relativization

a. ñ dà nyè lá à [pògò nà] nàng sòrè òi gànè dèyang.

1Sg Pst see.Perf F D woman Dem 1Sg C read.Perf 3Sg book last.year

‘I saw the woman whose book I read last year.’

b. ñ dà nyè lá à [pògò ná gànè], nàng sòrè òi dèyang.

1Sg Pst see.Perf F D woman Dem book 1Sg C read.Perf 3Sg book last.year

‘I saw the woman whose book I read last year.’

Furthermore, it is also licit to relativize the object of postposition and the object of comparison in Dàgàáàrè.

(12) PP relativization

a. à [pèé ná] Dàkòráá náng gàng òi zù é lá kpông.

D roof Dem Dàkòráá C lie.Perf 3Sg on be F big

‘The roof top on which Dàkòráá lay is big.’

b. à [pèé ná zù]. Dàkòráá náng gàng tì é lá kpông.

D roof Dem on Dàkòráá C lie.Perf be F big

‘The roof top on which Dàkòráá lay is big.’

(13) Comparative relativization

à [dáó ná] Dàkòráá náng è wògi gàngè éì záà kpiè lá.

D man Dem Dàkòráá C be tall pass yesterday die F

‘The man who Dàkòráá is taller than died yesterday.’

The structure of the PP relativization and the possessor relativization will be discussed in greater detail in Section 3. Crucially, Dàgàáàrè does not allow in-situ HIRCs unlike some other Gur languages (Bùlì (Hiraiwa, 2005, 2008, in preparation), Moorè (Peterson, 1974; Tellier, 1989), Dagbani (Wilson, 1963)), where the relativized head noun can remain in its original position. Compare (10b) with (14).\textsuperscript{8}

(14) a. Object HIRC

\*ñ dà sòrè lá à Dàkòráá náng ngmàa gànè dèyang.

1Sg Pst read.Perf F D Dàkòráá C write.Perf book last.year

‘I read the book that Dàkòráá wrote last year.’

b. Object HIRC

\*ñ dà sòrè lá à Dàkòráá náng ngmàa gànè ná dèyang.

1Sg Pst read.Perf F D Dàkòráá C write.Perf book Dem last.year

‘I read the book that Dàkòráá wrote last year.’

\textsuperscript{6} The use of resumptive pronouns in possessor relativization and PP relativization is fairly common in HIRCs in Gur languages. In addition, Bùlì uses a resumptive pronoun in long-distance relativization. Kabiýè uses resumption in subject positions. Also recall that ex-situ HIRCs discussed by Basilico (1996) employs resumption as well.

\textsuperscript{7} This example has another interpretation ‘I saw the woman’s book that I read last year.’ but we will ignore this interpretation as it is irrelevant to our discussions.

\textsuperscript{8} As we mentioned in the beginning of this section, the dialect that we deal with in this article is the Jirapa dialect, the main dialect of Dàgàáàrè. In fact, another dialect seems to allow in-situ HIRCs marginally in certain cases. Because it has interesting differences in syntax and lexical items and also because we do not have sufficient data, we will leave an investigation of dialectal differences for future research.
Because there is much parallelism between relative clauses and noun phrases cross-linguistically, let us examine the syntax of DP in some more detail. First, let us look at the placement of determiners. The element *ná* in Dágááré usually functions as a demonstrative determiner in Dágáárè.

(15) Demonstrative *ná*

\[ \text{â dâ lá â gánè ná.} \]
1Sg buy.Perf F D book Dem

‘I bought that book.’

The definite determiner *à* cannot basically be deleted (without changing the definiteness reading) when the DP appears without a relative clause, while the demonstrative *ná* can be omitted.

(16) Definite demonstrative omission

\[ \text{â dâ lá à gánè ã.} \]
1Sg buy.Perf F D book (Dem)

‘I bought the book.’

\[ \text{*â dâ lá ã gánè ná.} \]
1Sg buy.Perf F (D) book Dem

‘I bought that book.’

One puzzle about the Dágáárè DP structure is the fact that it is uniformly head-final except for the definite determiner *à*. Given the SVO word order of Dágáárè, the head-final DP word order is presumably derived from movement.\(^9\) Specifically, we assume that the demonstrative head Dem has an EPP feature\([+\text{DP}]\) that attracts the closest DP to its specifier, whereas the D head lacks such a feature. The derivation is represented as follows. The D lacks an EPP feature and hence nothing comes to its specifier. On the other hand, The Dem has an EPP feature and hence the entire DP moves to its specifier. As a result, the “D NP Dem” order obtains.

(17) a. à gá-mà ná
D book-Pl Dem
‘those books’

b. DP-structure

```
DP
  /\    
 D  DemP
   \   \     
    à  EPP
    /\   /
   NumP Dem'
      /\   /
     Num Num'
        /\   /
      tNumP tNumP
        /\   /
       mà ná
```

\(^9\) As Matt Shibatani (p.c.) pointed out, there may have been some diachronic changes from one word order to the other. Unfortunately, there is no record of older stages of the language.
In relative clauses, the demonstrative ná is optional and its presence/absence does not affect a semantic interpretation. On the other hand, the complementizer náng is obligatory. Significantly, the definite determiner à can also be omitted, with the demonstrative ná retained. If both the demonstrative and the definite determiner are omitted, however, the sentence becomes ungrammatical as a definite relative clause; it can only be interpreted as an indefinite relative clause.

(18)  
a. Subject relativization (Definite/Indefinite)

nung dà sórè lá à gànè ná / gànè ná / gànè *(náng) bing kyè.
‘I read the/the/a book that is lying here.’

b. Object relativization (Definite/Indefinite)

nung dà sórè lá à gànè ná / gànè ná / gànè Dàkóráá *(náng)
ngmáá déyàng.
write.Perf last.year
‘I read the/the/a book that Dàkóráá wrote last year.’

Thus, the fact that the definite determiner is freely omitted in relative clauses but not in non-relative contexts suggests that the determiner à in relative clauses is located in a different position. We propose that it in fact takes a CP clause as a complement, as shown in (19) (see Kayne, 1994).10

(19)  
(a) D and relative clauses

```
DP
 /   /
D CP
 \   
 à DemP / gànè ná / C / TP 
```

(b) D and NP

```
DP
 /   /
D DemP
 \   
 à NumP / gànè ná / Dem / tNumF ná
```

In other words, the determiner à takes the DemP as its complement in noun phrases, but it takes the CP instead in relative clauses.11 In DPs, the demostrative ná clearly forms a constituent with the noun phrase, as shown by the clefting test below.

10 Another construction in which a D takes a CP clause is a so-called Factive construction as shown in (i) (see Collins, 1994).

(i) Factive Construction

```
[à [Dàkóráá lá gànè déyàng yélle]] pílé lá ó póg(j) póó yágá.
D Dàkóráá C write.Perf D book last.year Part. whiten.Perf F 3.Sg wife stomach a lot
```

‘The fact that Dàkóráá wrote a book last year pleased his wife a lot.’

11 As we have observed, the omission of ná in relative clauses does not show any significant semantic difference – in particular, distal function. This leads us to think that the demonstrative determiner in relative clauses is syntactically and semantically bleached and grammaticalized into a definite determiner. We will, tentatively, assume that the demonstrative determiner ná is reanalyzed as a definite marker, losing its deictic function, when the NP functions as a relativized head in Dágaárê. We leave for future research the investigation of the nature of the function of the demonstrative determiner in relative clauses in general.
One might wonder if *ná has grammaticalized into a complementizer in relative clauses, as *that in English. There is good reason, however, to think that *ná in relative clauses is a determiner not a complementizer. Consider the pair (21).

(21) Relativization and numerals

a. ñ dà di lá à mônó-ri *ánúú ná Dákóráá náng då
   1Sg Pst eat.Perf F D mango-Pl five Dem Dákóráá C buy.Perf
   zàámèng.
   yesterday
   ‘I ate the five mangoes that Dákóráá bought yesterday.’

b. ñ dà di lá à mônó-ri ná *ánúú Dákóráá náng då
   1Sg Pst eat.Perf F D mango-Pl Dem five Dákóráá C buy.Perf
   zàámèng.
   yesterday
   ‘I ate the five mangoes that Dákóráá bought yesterday.’

As the sentence (21b) shows, the numeral *ánúú can come to the right of *ná. This should be impossible if *ná were a clausal functional head (like C(omplementizer)) as shown in (22).\(^\text{12}\)

\[\begin{align*}
\ast ná & \text{ as C (i.e. a clausal functional head)} \\
\text{DP} & \\
\text{\quad D CP} & \\
\text{\quad \quad \quad à DP C'} & \\
\text{\quad \quad \quad \quad gànè C TP} & \\
\text{\quad \quad \quad \quad \quad \quad ná \ldots..} & \\
\end{align*}\]

Similarly, when two modifying clauses are coordinated to modify the relativized head noun, *ná cannot appear in the second conjunct. If *ná were a complementizer, it would be expected to appear in both conjuncts. Compare the Dágááre examples (24) with the English counterpart.

12 When P is pied-piped with the relativized head noun, it must follow the demonstrative *ná (if any); it cannot come before the demonstrative.

(i) The Placement of P and the demonstrative

\[\begin{align*}
\ast ñ & \text{ dà dà lá à lóóre pòó ná [Dákóráá náng gàng].} \\
1Sg & \text{ Pst buy F D car in Dem Dákóráá C lie.Perf} & \\
\text{‘I bought the car in which Dákóráá slept.’} & \\
\text{This confirms that the demonstrative *ná is not a complementizer or a relative pronoun, but rather forms a constituent with the relativized head noun. See the detailed discussion in Section 3.} & \\
\end{align*}\]

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(23)  a. This is the article [that John wrote] and [that Mary reviewed].
    b. This is the article [which John wrote] and [which Mary reviewed].

(24)  Coordination of relative clauses and ná

a.  nā ù̀̀ ̀̀ lá à zómò ná Dákóráá náng dà ̀̀ nyógè kà Dérè dà
    1Sg eat.Perf  F  D fish  Dem Dákóráá  C  Pst catch.Perf Conj.  Dérè  Pst
dógè.
    cook.Perf
   ‘I ate the fish that Dákóráá caught and Dérè cooked.’

b.  *nā ù̀̀ ̀̀ lá à zómò ná Dákóráá náng dà ̀̀ nyógè kà ná Dérè
    1Sg eat.Perf  F  D fish  Dem Dákóráá  C  Pst catch.Perf Conj. Dem Dérè
dà  dogè.
    Pst  cook.Perf
   ‘I ate the fish that Dákóráá caught and Dérè cooked.’

Finally, let us address a significant question of whether the relationship between the relativized head and the gap
(or its resumptive pronoun) is mediated by movement or control or a kind of binding. As shown in the examples (25),
the fact that relativization in Dâgâáre’ is subject to islands/subjacency suggests that the former is right. They show
that relativization out of a complex NP or an adjunct clause is illicit in Dâgâáre’. Note that island effects remain irrespective
of the presence/absence of the resumptive pronouns.

(25)  a. Complex NP Constraint
    *nà dà sôrè lá à gànè, nà [nàng nyè [à pògò nà nàng
    1Sg Pst read.Perf  F  D book  Dem 1Sg  C  see.Perf  D  woman  Dem  C
    ngmàà  (òtì)].
    write.Perf (3Sg)
   ‘I read the book that I saw the woman who wrote.’

b. Adjunct Island
    *nà dà sôrè lá à gànè, nà [nàng nyè [à pògò ò nàng
    1Sg Pst read.Perf  F  D book  Dem 1Sg  C  see.Perf  D  woman  3Sg  C
    ngmàà-rà  (òtì)].
    write-Imper (3Sg)
   ‘I read the book that I saw the woman when she was writing it.’

2.2. The inteririors: complementizer and particles

We now turn our attention to the interiors with particular focus on the preverbal particles observed in relative
clauses and the position of the subject. We provide evidence that the particle nang is a complementizer. It cannot be
omitted in Dâgâáre’ relativization and therefore is an indispensable syntactic ingredient.

2.2.1. Preverbal particles

Dâgâáre’ has a rich inventory of preverbal Tense-Aspect-Mood particles (see Bodomo, 1997). The preverbal particle
nang has other uses in the grammatical system of Dâgâáre’. Outside relative clauses, one of its clearest uses is as a
preverbal particle that means ‘still’. Note, however, that the tone is low in this use.

(26)  A preverbal particle nang

    à dòó nang nyúúró  lá à kòó.
    D man still  drink.Imp F  D  water
   ‘The man is still drinking the water.’
In relativization, on the other hand, it is marked with a high tone.

(27) náng in a relative clause

ñ dá sóré lá à gánè ná [Dàkóráá náng ngmàà déyâng].
1Sg Pst read.Perf F D book Dem Dàkóráá C write.Perf last.year

‘I read the book that Dàkóráá wrote last year.’

The high-tone complementizer náng is also used in temporal adverbial clauses.

(28) náng in a temporal clause

[à dóó náng wà tá], ñ dé lá gánè kò ó.
D man when come.Perf reach.Perf 1Sg take.Perf F book give 3Sg

‘When the man arrived I gave him a book.’

Despite the morphological identity, these particles are distinct syntactic heads. The complementizer náng can in fact co-occur with the preverbal particle náng. Furthermore, it can also co-occur with other preverbal particles such as the past tense particles da and za. Crucially, the complementizer náng precedes all of those so-called preverbal particles.

(29) Preverbal particle náng and complementizer náng

ñ nyè lá à gánè ná [Dàkóráá náng náng ngmàà-rá].
1Sg see.Perf F D book Dem Dàkóráá C still write-Imperf

‘I saw the book that Dàkóráá is still writing.’

(30) a. Object relativization (Past)

ñ dá sóré lá à gánè ná Dàkóráá (*dà) náng (dà) ngmàà
1Sg Pst read.Perf F D book Dem Dàkóráá (Pst) C (Pst) write.Perf
déyâng.
last.year
‘I read the book that Dàkóráá wrote last year.’

b. Object relativization (Past)

ñ dá sóré lá à gánè ná Dàkóráá (*záá) náng (záá) ngmàà.
1Sg Pst read.Perf F D book Dem Dàkóráá (Pst) C (Pst) write.Perf
‘I read the book that Dàkóráá wrote yesterday.’

Whereas the relativizing particle náng must precede the tense and all the other particles, the preverbal particle náng must follow the tense particle.

(31) a. ò dá náng bá wà sóré.
3Sg Pst still Neg come yet
‘He hadn’t come yet.’

b. ñ nyè lá à gánè ná Dàkóráá náng dá náng ngmàà-rá.
1Sg see.Perf F D book Dem Dàkóráá C Pst still write-Imperf
‘I saw the book that Dàkóráá was still writing.’
The future particle *nà* also follows the complementizer *náng*, as shown below.

(32) Object relativization (Future)

\[ nà \text{ dà nyèc lâ à gânè nà Dâkôráá (*nà) náng (nà) kò má biéú. } \]
I Pst see.Perf F D book Dem Dâkôráá (Fut) C (Fut) give me tomorrow

‘I saw the book that Dâkôráá will give me tomorrow.’

It is worth noting that the fact that these tense particles can occur within the relative clauses in Dâgááré indicates that the relative clauses are fully finite (and hence not “reduced” in any sense). The co-occurrence and word order facts demonstrate that the relativizing particle *náng* is a complementizer.

(33) The hierarchical structure of particles

```
CP
  \[ náng \]
  \[ T \]
  \[ vP \]
  \[ dâ/nà \]
  \[ *náng \]
  \[ vP \]
  \[ VP \]
```

2.2.2. Subject, and verb

As the examples in (34) show, the time adverb in Dâgááré can be placed at the right edge of the clause (34a), or at the left-edge of the clause (34b), but not in the medial positions (34c)–(34e). In either case, the natural assumption is that the former is adjoined to TP and the latter is topicalized. The grammatical example (34f) indicates that the temporal adverb can also incorporate into T.

(34) a. Dâkôráá dà ngmáá lâ à gânè dèyâng.
Dâkôráá Pst write.Perf F D book last.year
‘Dâkôráá wrote the book last year.’

b. dèyâng Dâkôráá dà ngmáá lâ à gânè.
last.year Dâkôráá Pst write.Perf F D book

c. *Dâkôráá dà ngmáá lâ dèyâng à gânè.
Dâkôráá Pst write.Perf F last.year D book

d. *Dâkôráá dà ngmáá dèyâng lâ à gânè.
Dâkôráá Pst write.Perf last.year F D book

e. *Dâkôráá dà dèyâng ngmáá lâ à gânè.
Dâkôráá Pst last.year write.Perf F D book

f. Dâkôráá dèyâng dà ngmáá lâ à gânè.
Dâkôráá last.year Pst write.Perf F D book

Now let us examine adverb placement in relative clauses. An embedded adverb cannot come before the complementizer (35c). It cannot be placed before the demonstrative *nà* (35d) or just after it (35e). Neither can

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13 The particle *náng* does not have any use as a complementizer in Wh-questions and focus constructions. In these constructions, the complementizer *ka* is used (see (9b) and (20b)). It should be noted that there is no construction where *ka* and *náng* co-occur, which supports our conclusion that *náng* is a complementizer, rather than a Tense-Aspect-Mood particle.
the adverb precede the relativized head noun (35f). Thus the well-formed adverb placement is either between the complementizer náng and the verb (35b) or at the end of the relative clause (35a).

The fact that the adverb cannot precede náng shows that the latter is located higher than T. Therefore it confirms our conclusion that it is C.

(35) Adverb placement in Dágááré relativization

a. ní dà sóré lá [â gànè ná Dákóráá náng dà ngmáá déyáng].
  1Sg Pst read.Perf F D book Dem Dákóráá C Pst write.Perf last.year
b. ní dà sóré lá [â gànè ná Dákóráá náng déyáng dà ngmáá].
  1Sg Pst read.Perf F D book Dem Dákóráá C last.year Pst write.Perf

c. *ní dà sóré lá [â gànè ná Dákóráá déyáng náng dà ngmáá].
  1Sg Pst read.Perf F D book Dem Dákóráá last.year C Pst write.Perf

d. *ní dà sóré lá [â gànè déyáng ná Dákóráá náng dà ngmáá].
  1Sg Pst read.Perf F D book last.year Dem Dákóráá C Pst write.Perf

e. *ní dà sóré lá [â gànè ná déyáng Dákóráá náng dà ngmáá].
  1Sg Pst read.Perf F D book Dem last.year Dákóráá C Pst write.Perf
f. *ní dà sóré lá [déyáng â gànè ná Dákóráá náng dà ngmáá].
  1Sg Pst read.Perf F last.year D book Dem Dákóráá C Pst write.Perf

Assuming that the adverb in the example (34b) is a topic position, [Spec, TopP], the ungrammaticality of the examples (35e) and (35f) suggests that relative clauses lack a TopP projection. In fact, no topicalization is allowed in Dágááré relative clauses.

Now, notice that the subject in the relative clause must precede the complementizer. We assume, adopting Rizzi (1997), that the left periphery of the CP domain is decomposed into layers of functional categories: TopicP (TopP), ForceP (ForceP), FocusP (FP), and FinitenessP (FinP).\footnote{A CP-recursion structure is also compatible with the analysis presented below.} The natural conclusion then will be that the Fin head has an EPP feature just like T, and requires the subject – the closest element – to move to its specifier (see Hiraiwa, 2005 and Chomsky, 2000, 2004). In fact, such a subject movement over C is well attested in some other Gur languages (Hiraiwa, 2005, 2008).

2.3. Interim summary

To summarize, Dágááré relativization involves a left-moved head noun and the complementizer (Fin) náng. The subject obligatorily moves to [Spec, FinP]. The relativized head noun optionally takes a definite determiner and a
demonstrative for definite relative clauses. The particle náŋ is best understood as a complementizer given the co-occurrence and word order evidence. In contrast, the placements of the demonstrative ná show that it is not a complementizer. Rather it is a constituent of the relativized noun phrase.

(37) a. The relativized head always appears at the left edge of the clause.
   b. The demonstrative ná is not a constituent of the relative clause (i.e. it is not a complementizer, either).
   c. The complementizer náŋ is located structurally higher than other preverbal TAMP particles.
   d. Movement is involved.

Having established the internal structure of the relative clauses in Dàgàárè, in the next section, we will show evidence that the relativized head nouns are still located internally to the relative clauses.

3. Left-headed but internally-headed relative clauses

Given the fact that Dàgàárè is an SVO language, it is indeed expected that its relativized head noun appears at the left periphery, not at the right periphery, according to Emmon Bach’s correlation between word order and Wh-movement (see Bach, 1971; see also Bresnan, 1970). As we have shown in the first half of this article, Dàgàárè does not allow what is clearly considered to be in-situ HIRCs. Namely, the relativized head noun cannot remain in-situ. Rather, the relativized head noun is always placed at the left edge of the clause, just as in English. This is apparently in accordance with Peter Cole’s generalization that HIRCs are limited to SOV languages (see Cole, 1987). However, Hiraiwa (2005) argues that such a word order generalization does not hold cross-linguistically and shows that there are Gur languages that have SVO word order but still allow in-situ HIRCs perfectly, as first noticed by Tellier (1989).

The important question, then, concerns the precise structure of the relative clause in Dàgàárè—where does the fronted relativized head noun reside, and is it external or internal to the relative clause? If evidence suggests that it is internal despite its appearance, Dàgàárè provides a significant example of another new type of HIRC: left-headed HIRCs. As we have seen, however, mere word order does not tell us whether the left-peripheral head is internal or not.15

Basilico (1996) notes the existence of HIRCs in Diegueño and Mojave with its relativized head displaced but yet clause-internally. As we have seen in Section 1, movement of the head noun in front of the subject is optional and he argues that it targets the TP-adjointed position. In this section, we argue that Dàgàárè relative clauses are indeed internally-headed and hence instantiate ex-situ HIRCs. However, Dàgàárè crucially differs from those languages in that the landing site of the internal head noun is the CP-edge and the movement is always obligatory.

(38) a. The head noun in Dàgàárè is obligatorily moved.
   b. The landing site is the edge of CP – [Spec, ForceP].

These are in fact naturally expected given that Dàgàárè is a Wh-movement language and there is cross-linguistic parallelism between Wh-questions and relativization. Recall also that Dàgàárè does not have scrambling.

The proposed structure is shown in (39) (successive-cyclic movement is not indicated for simplicity). In other words, the left-moved head noun is located at the edge of CP, but crucially not outside of the relative clause.

15 Dàgàárè relative clauses do show reconstruction effects. In the example (i), the subject pronoun of the embedded clause must be disjoint with the R-expression within the relativized head noun. Thus, the Condition C violation shows that raising is involved in relativization in Dàgàárè. However, it still does not tell us whether the final structure of relative clauses is internally-headed or externally-headed (Recall Section 1).

(i) *ń nyí lá à Dákóráá fotó ná náŋ pénti.
  1Sg see.Perf F Dákóráá photo Dem 3Sg C paint.Perf
  ‘I saw Dákóráá’s picture that he painted.’

As a side note, a reflexive binding via reconstruction does not work in Dàgàárè for some reason that we do not understand.

(ii) *ń nyí lá à ō měngé fotó Dákóráá náŋ pénti.
  1Sg see.Perf F D 3Sg self photo Dákóráá C paint.Perf
  ‘I saw the picture of himself that Dákóráá painted.’

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Translating a CP-recursion structure into Rizzi’s articulated CP clausal structure, the head noun undergoes an A-bar-movement to a higher CP layer [Spec, ForceP]. Recall that the complementizer náng has an EPP feature and hence the closest DP – the subject – moves to [Spec, FinP]. Because the determiner à lacks an EPP feature in Dágááré (see Section 2), the relativized head noun does not move to [Spec, DP], remaining internally to the relative clause.  

(39)  Left-headed HIRC

\[
\begin{array}{c}
\text{DP} \\
\downarrow \\
\text{ForceP} \\
\downarrow \\
\text{Force} \\
\downarrow \\
\text{Subj} \\
\downarrow \\
\text{Fin} \_{\text{EPP}} \\
\downarrow \\
\text{TP} \\
\downarrow \\
\text{T} \\
\downarrow \\
\text{VP} \\
\end{array}
\]

\[
\begin{array}{c}
\text{dà} \\
\text{...A_1...} \\
\end{array}
\]

Dágááré strikingly differs from some other Gur languages (such as Bülü; see Hiraiwa, 2005, 2008) in that an in-situ HIRC is impossible. Furthermore, unlike Diegueño and Mojave, whose head-raising is simply an option, the movement of the head noun is obligatory. If correct, then the existence of Dágááré-type left-headed HIRCs is of considerable typological significance. The existence of left-headed HIRCs, if established, also has far-reaching consequences for the cross-linguistic typology of HIRCs. First, this type of ex-situ HIRCs has not been observed in the literature. Second, most importantly, it suggests a totally new picture of the typology of HIRCs (cf. Gorbet, 1977; Cole, 1987; Culy, 1990) and a careful re-examination of the relative clauses that have been simply assumed to be HERCs. Furthermore, it provides another piece of evidence against Cole’s Generalization (Cole, 1987) that HIRCs are restricted to languages with null pronouns and SOV word order; Dágááré neither allows null pronouns nor shows SOV word order.

In the reminder of this article, we demonstrate that Dágááré relativization is an instance of left-headed HIRCs, based on two empirical arguments – coordinated PP relativization and coordinated possessor relativization. The evidence is based on syntactic constituency, which is one of the most solid tests for syntactic structures in transformational syntactic theory. The conclusion is further supported by the ungrammaticality of extraposition of relative clauses and the Indefiniteness Restriction.

3.1. PP relativization and pied-piping

Dágááré has a number of postpositions. For example, the postposition póó ‘in’ takes a noun phrase as its complement.

(40)  Dákóráá gàŋg  lá [PP à lórè póó].
Dákóráá lie.Perf  F  D car in
‘Dákóráá slept in the car.’

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16 See Rizzi (1997) for evidence that a relativized head noun in Italian is located in [Spec, ForceP], higher than a position for Wh-phrases. The fact that Wh-phrases and focused elements are obligatorily marked with the focus marker là in Dágááré shows that they are considered to be in [Spec, FocP], in contrast with relativized head nouns, which never take such a marker.
In Dàgàárà̀, there are two ways to relativize the complement of P: either a P is stranded with a resumptive pronoun of the relativized head noun as in the example (41a) or it is pied-piped with the relativized head to the initial position as in the example (41b). In the former case, the resumptive pronoun is obligatory.\footnote{There is a semantic effect of pied-piping. The relative clause without pied-piping only has an interpretation in which what was bought was ‘the car’. On the other hand, when pied-piping takes place, the relative clause becomes ambiguous: what was bought was ‘the car’ or ‘the inside of the car’ (possibly, the interior of the car alone). Sometimes, the latter interpretation is more readily available, but in principle, (41b) allows the same interpretation as (41a). We ignore the latter interpretation in this article, because it is irrelevant to our main focus.}

(41) relativization and pied-piping of P

a. ń dá lá à [\text{Forc}ep lóóré ná [Dàkóráá náng gàŋ gò póó]].
   1Sg buy.Perf F D car Dem Dàkóráá C lie.Perf 3Sg in
   ‘I bought the car in which Dàkóráá slept.’

b. ń dá lá à [\text{Forc}ep láóré ná póó [Dàkóráá náng gàŋ]].
   1Sg buy.Perf F D car Dem in Dàkóráá C lie.Perf
   ‘I bought the car in which Dàkóráá slept.’

That both relative clauses in (41) allow the same interpretation in which the relativized head is lóóré alone is supported by the fact that they can be an answer to a Wh-question (42).

(42) lóó-bóó lá ká fó dá?
   car-which F C 2Sg buy.Perf
   ‘Which car did you buy?’

If the relative clause is internally-headed and left-headed, the structure should be as follows.

(43) left-headed HIRC

\begin{tikzpicture}[scale=0.7,transform shape]
  \node (DP) at (0,0) {DP};
  \node (D) at (-1.5,0) {D};
  \node (P) at (0,-1) {P};
  \node (NP) at (-1.5,-1) {NP};
  \node (PP_i) at (-2.5,-2) {PP$_i$};
  \node (ForceP) at (-3,-2) {\text{Forc}\text{ep}};
  \node (Force) at (-2,-3) {\text{force}};
  \node (FinP) at (-1.5,-3) {\text{Fin}\text{p}};
  \node (Subj) at (-2,-4) {\text{Subj}};
  \node (Fin[\text{EPP}]) at (-1.5,-4) {\text{Fin[\text{EPP}]});
  \node (TP) at (-3,-4) {\text{TP}};
  \node (T) at (-3,-5) {T};
  \node (VP) at (-2,-5) {\text{VP}};
  \node (t_{\text{Subj}}) at (-2,-6) {t_{\text{Subj}}};
  \node (náng) at (-1.5,-4) {náng};
  \node (dá) at (-2,-6) {dá};

  \draw[->] (DP) -- (D);
  \draw[->] (D) -- (PP_i);
  \draw[->] (PP_i) -- (NP);
  \draw[->] (NP) -- (P);
  \draw[->] (P) -- (ForceP);
  \draw[->] (ForceP) -- (Force);
  \draw[->] (Force) -- (FinP);
  \draw[->] (FinP) -- (Subj);
  \draw[->] (Subj) -- (Fin[\text{EPP}]);
  \draw[->] (Fin[\text{EPP}]) -- (t_{\text{Subj}});
  \draw[->] (t_{\text{Subj}}) -- (TP);
  \draw[->] (TP) -- (T);
  \draw[->] (T) -- (VP);
  \draw[->] (VP) -- (VP);

\end{tikzpicture}

The pied-piping facts alone, however, do not provide us with decisive evidence for left-headed HIRC$s. In fact, they could also be accounted for if the relative clauses in Dàgàárà̀ were externally-headed (whether (1a) or (3)). Under such an analysis, one might say that the PP (the postposition and the resumptive pronoun) is actually moved to [Spec, \text{Forc}\text{ep}] and the relativized head noun is base-generated in a position external to \text{Forc}\text{ep} (it is base-generated externally in traditional analyses or is raised in Bhatt’s (2002) analysis). This hypothetical derivation is illustrated in the structure (44).
Of course, this analysis poses a conceptual question: why is the PP moved to [Spec, ForceP]? Furthermore, even if one could somehow motivate this movement, it would be necessary to restrict such a movement only in cases where the complement of P is an empty category.

However, this analysis makes a wrong prediction. The derivation (44) should expect that the coordination of PP relative clauses would be grammatical, with the PPs fronted to [Spec, ForceP] in each conjunct. This is in fact grammatical in English, whose relative clauses are allegedly externally-headed (see Bhatt, 2002 for extensive evidence).

(45) This is the car [ForceP in which John slept] and [ForceP on which Mary slept].

(46) HERC and coordination of PP relative clauses

However, such examples are ungrammatical in Dàgàárè, contrary to the prediction. As shown in (47b), when the P is pied-piped, the sentences result in ungrammaticality. Instead, the PPs must be left in-situ with resumptive pronoun as in (47a).

(47) Pied-piping and coordination

a. à [lôôrè nà [Dàkôráà náng gáng ô póšè] kà [Dërë găng ô zû]
D car Dem Dàkôráà C lie.Perf 3Sg in Conj. Dërë lie.Perf 3Sg on lá nyér].
Cop this
‘The car in which Dàkôráà slept and on which Dërë slept is this.’
One might wonder if the sentence (47b) is ungrammatical, because the movement of PP in the second is not licensed for some reason. However, the sentence is still ungrammatical even if the PP is left in-situ with the resumptive pronoun.

(48) *á lóbré ná [(ò) póó Dákóráá náng gang] ká [(ò) zú Déré gâng]
    D car Dem 3Sg in Dákóráá C lie.Perf Conj. 3Sg on Déré lie.Perf
    lá nyé.
    Cop this
    ‘The car in which Dákóráá slept and on which Déré slept is this.’

All of these facts are mysterious if the relative clause in Dágáárè permits an externally-headed structure at all. The ungrammaticality of (47b) is explained if the relative clause in question has the head-internal structure as illustrated in (49). This is because the PP and the head noun must form a constituent and hence there is no way to coordinate CPs excluding the relativized head noun and to produce the surface form (47b).

(49) **Left-headed HIRC and coordination of PP relative clauses**

On the other hand, the example without pied-piping (47a) is naturally explained as a result of Across-the-Board extraction of the possessor relativized noun phrase as depicted in (50).

(50) **Left-headed HIRC and coordination of in-situ PP relative clauses**
3.2. Possessor relativization and pied-piping

The second evidence comes from possessor relativization. Recall that Dàgáàrè allows possessor relativization (51a). Of great importance for our discussion is the fact that the sentence (51b) is also grammatical, where the whole possessor-possessee complex has been moved to the left (the resumptive pronoun is required in (51a) and slightly preferred in (51b).

(51) Possessor relativization without pied-piping

a. ñ dá nyé lá à [póɡó ná [ñ náng sóré *(ó) gánè déyâng]].
   1Sg Pst see.Perf F D woman Dem 1Sg C read.Perf 3Sg book last.year
   ‘I saw the woman whose book I read last year.’

b. ñ dá nyé lá à [póɡó ná ò(ó) gánè [ñ náng sóré déyâng]].
   1Sg Pst see.Perf F D woman Dem 3Sg book 1Sg C read.Perf last.year
   ‘I saw the woman whose book I read last year.’

The syntactic derivation of possessor relativization with pied-piping is represented below where NP_1 is gánè and NP_2 is the possessor póɡó ná.

(52) Left-headed HIRC (pied-piping of the possessed NP)

Again, an interaction of coordination and pied-piping demonstrates that the relativized head is still internal to the relative clause. Compare the English examples with the Dàgáàrè counterparts. While English relative clauses are externally-headed and hence allow coordination of relative clauses with fronted possessed NPs (with the relative pronouns), Dàgáàrè disallows such coordination.

(53) I greeted the woman [ForceP whose book I read yesterday] and [ForceP whose husband John knows well].
This is expected given that the relative clauses in English are externally-headed and the relativized head noun and the relative pronoun (plus the possessed NP) do not form a syntactic constituent. In contrast, in left-headed HIRCs, the relativized possessor NP and the pied-piped possessed NP form a syntactic constituent and are located in [Spec, ForceP] (see (52)). Hence the coordination fails with pied-piping because the form is never derivable under the left-headed HIRC structure, as shown in the examples (55) and (56).

(55) Possessor relativization and pied-piping

a. ñ puòrì lá à [pògò nà [ñ náng sórè ò gàñè] kà [Déré 1Sg greet.Perf F D woman Den 1Sg C read.Perf 3Sg book Conj. Déré bòngè è sèrè]].

   ‘I greeted the woman whose book I read and whose husband Déré knows.’

b. *ñ puòrì lá à [pògò nà [(ò) gàñè è náng sórè] kà [(ò) 1Sg greet.Perf F D woman Den 3Sg book 1Sg C read.Perf Conj. 3Sg sèrè Déré bòngè]].

   ‘I greeted the woman whose book I read and whose husband Déré knows.’

c?*ñ puòrì lá à [pògò nà [(ò) gàñè è náng sórè] kà [Déré 1Sg greet.Perf F D woman Den 3Sg book 1Sg C read.Perf Conj. Déré bòngè è sèrè]].

   ‘I greeted the woman whose book I read and whose husband Déré knows.’

(56) Left-headed HIRC and coordination of pied-piped possessor relative clauses

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The coordination is licit as long as the possessed NPs are left in-situ, as we have also seen in PP relativization. 18

(57) Left-headed HIRC and coordination of possessor relative clauses

\[
\begin{array}{c}
\text{DP} \\
\text{D} \\
\text{ForceP} \\
\text{NP} \\
\text{Force'} \\
\text{Force} \\
\text{FinP} \\
\text{FinP1} \\
\text{and} \\
\text{FinP2} \\
\ldots [\text{NP} \text{t}_1] \ldots \\
\ldots [\text{NP} \text{t}_1] \ldots
\end{array}
\]

3.3. Extraposition

The conclusion that relative clauses in Da`ga´a´re` are not externally-headed is confirmed by the fact that extraposition of relative clauses are strictly ungrammatical in Da`ga´a´re`, unlike in English, whose relative clauses are arguably externally-headed.

   b. I read the book yesterday [ForceP which John wrote last year].

Note that in left-headed HIRCs, the ForceP contains the relativized head NP and hence the former cannot be extraposed in such a way that excludes the latter. In externally-headed relative clauses like those in English, the ForceP is either adjoined to an NP or is the complement of an N. Thus a relative clause can be extraposed independently of the relativized head NP.

(59) *Extraposition of relative clauses

a. ñ dà sóré; lá à [ForceP gáñe ná [Dákóráá náng ngmáà e₁/∗ô_i]
   1Sg Pst read.Perf F D book Dem Dákóráá C write.Perf φ/3Sg
déyång] gààmëng.
   last.year yesterday
   ‘I read the book that Dákóráá wrote last year yesterday.’

b. *ñ dà sórë; lá à gáñe ná gààmëng [Dákóráá náng ngmáà
   1Sg Pst read.Perf F D book Dem Dákóráá C
e₁/∗ô_i
déyång].
   write.Perf φ/3Sg last.year
   ‘I read the book that Dákóráá wrote last year yesterday.’

18 To complete our arguments, we should note that coordinated PP relativization and coordinated possessor relativization behave exactly in the same way as normal relative clauses in terms of island effects. Thanks to an anonymous reviewer for pointing this out.

(i) *á lóřë ná [ñ nyë lá à [póò ná náng gàng ò póó]] ká [ñ nyë lá à [dóó
   D car Dem 1Sg see.Perf F D woman Dem C lie.Perf 3Sg in Conj. 1Sg see.Perf F D man
   ná gàng ò zǔ]] lá nyë.
   Dem lie.Perf 3Sg on Cop this
   ‘The car in which I saw the woman who slept e₁ and on which I saw the man who slept e₂ is this.’
We should mention that this point can also be illustrated with coordinated relative clauses.

(60) a. ñ puòrí lá à [pógó ná [ñ näng sôrê o gânë] kà [Dére 1Sg greet.Perf F D woman Den 1Sg C read.Perf 3Sg book Conj. Dére bôngê o sérê] zàámëng. know 3Sg husband yesterday
   ‘I greeted the woman whose book I read and whose husband Dére knew yesterday.’

b. *ñ puòrí lá à pógó ná zàámëng [ñ näng sôrê o gânë] 1Sg greet.Perf F D woman Den yesterday 1Sg C read.Perf 3Sg book kà [Dére bôngê o sérê].
   Conj. Dére know 3Sg husband
   ‘I greeted the woman yesterday whose book I read and whose husband Dére knew.’

This eliminates the possibility that coordinated possessor relative clauses have a totally different structure. Hulsey and Sauerland (2006) show that extraposition is ungrammatical even in English, when a raising derivation – a head-internal structure in their terms – is forced. They argue that English relative clauses are structurally ambiguous between head-external and head-internal structures. Thus, when an idiom chunk or reconstruction is involved as in (61) and (62), extraposing the relative clause is prohibited, just as we have seen in Dàgàárë (the examples are cited from Hulsey and Sauerland, 2006).

(61) a. Mary praised the headway that John made.
   b. *Mary praised the headway last year that John made.

(62) a. I saw the picture of himself that John liked.
   b. *I saw the picture of himself yesterday that John liked.

Thus the ungrammaticality of extraposition in Dàgàárë and a certain type of relative clauses in English are expected given the structure (39).

3.4. Non-restrictives and the indefiniteness restriction

Another piece of corroborating evidence is the lack of appositive relative clauses in Dàgàárë. Dàgàárë lacks non-restrictive relative clauses with a proper noun as a head noun, as indicated by the ill-formed example (63).

(63) Non-restrictive relative clause

?*ñ dà nyë lá Dàkóràáá nàng ngmàà â gânë dëyang.
   1Sg Pst see.Perf F D àkóràá C wrote D book last.year
   ‘I saw Dàkóràáá, who wrote the book last year.’

If the proper noun Dàkóràáá is accompanied by the definite determiner and the demonstrative, the relative clause obligatorily becomes restrictive, which restricts a set of people whose name is Dàkóràáá.

(64) Restrictive relative clause

ñ dà nyë lá à Dàkóràáá nàng ngmàà â gânë dëyang.
   1Sg Pst see.Perf F D àkóràáá Dem C wrote D book last.year
   ‘I saw the Dàkóràáá who wrote the book last year.’

The absence of non-restrictive relative clauses in Dàgàárë would be puzzling given that no other principles prevented the language from allowing non-restrictives.
However, it straightforwardly follows if the structure of the relative clauses in Dâgáárè is always internally-headed. It has been well known in the literature that HIRC are cross-linguistically subject to what Williamson (1987) calls *The Indefiniteness Restriction*. Thus, relativized head nouns of HIRC must always be indefinite. A famous example in Lakhota is cited below. Note that the relativized head noun can take the indefinite determiner, but not the definite determiner.

(65) Lakhota (Williamson 1987: 171)

      Mary quilt Id make D Dem 1Sg-buy 
      ‘I bought the quilt that Mary made.’

      Mary quilt D make D Dem 1Sg-buy 
      ‘I bought the quilt that Mary made.’

Not surprisingly, an in-situ HIRC in Lakhota disallows a non-restrictive relative clause. Thus, the following sentence, with the first person pronoun as an internal head, is ungrammatical.

(66) Lakhota (Williamson 1987: 175)

   *[[(Miye makuţi) ki cha] wichawota ki ekta mnj kte 
      1Sg.Emph 1Sg.sick D/D feat D to 1Sg.go Fut
      ‘I, who am sick, will go to the feat.’

Now, we correctly expect that a proper noun, which is clearly a definite noun phrase, cannot appear as a relativized head in Dâgáárè despite the fact that it appears at the left periphery as in English. This is so, precisely because the relative clause is internally-headed and hence must conform to the Indefiniteness Restriction. And to the best of our knowledge, there is no language attested at this point in which non-restrictives are formed using HIRC.

Finally, it should be emphasized that the coordination facts, the impossibility of extraposition, as well as the Indefiniteness Restriction all demonstrate that relative clauses in Dâgáárè are unambiguously internally-headed. If Dâgáárè allowed externally-headed relative clauses in addition to internally-headed relative clauses, the coordinated PP/possessor relativization, extraposition, and a non-restrictive relative clause should all be grammatical.19

3.5. Alternatives

The editors for *Lingua* pointed out a possibility that the coordinated relative clauses in English and Dâgáárè actually involve a deletion of an identical relativized noun phrase. The schematic structure would then be something like below.

(67) a. I greeted [the woman] [whose book I read yesterday] and [the woman] [whose husband John knows well].

   b. 
      \[
      \text{NP}_1 \quad \text{NP}_2 \\
      \text{NP}_1 \quad \text{NP}_2 \quad \text{NP}_1 \quad \text{NP}_2
      \]
      \[
      \text{ForceP}_1 \quad \text{and} \quad \text{ForceP}_2
      \]

19 Recall that relativized head nouns in Dâgáárè are marked with the demonstrative *na*. This raises a question about the Indefiniteness Restriction. We assume, however, that the demonstrative in this environment is grammaticalized and has lost definiteness and suggest that it may function as a specific indefinite determiner. Some Gur languages use a dedicated specific indefinite determiner to mark a relativized head. See Hiraiwa (2008, in preparation) for a comparative study of relative clauses in Gur languages and the role of specific indefinite determiners. See Greenberg (1978) for grammaticalization of demonstratives.
Under this analysis, what are syntactically coordinated are two identical noun phrases – external relativized head nouns – rather than relative clauses. But phonological deletion of the second identical NP gives rise to the appearance that two relative clauses (ForcePs) are coordinated. If this is a possible analysis, the apparent coordination facts lose their force. For example, one could argue that the grammaticality of the coordination in English is due to the deletion rule, while its ungrammaticality in Dāgārē is due to an absence of such a rule (whatever an explanation for this asymmetry may be). If so, the (un)grammaticality in English and Dāgārē would not tell us anything about the syntactic structures of their relative clauses.

Of course, such an analysis requires a principle of deletion that does not overgenerate unwanted sentences and such a rule must also be general enough. We do not think of any such principle, but let us simply suppose that such a deletion existed. However, this alternative can be explicitly excluded for Dāgārē because the language uses different coordination markers for nominal and clausal coordinations. While the clausal coordinator is ka as we have seen above, the nominal coordinator is ne.

The use of ka in the sentences (47a) and (55a) clearly demonstrates that the coordinated relative clauses in question are an instance of clausal coordination. If it were a nominal coordination with the second identical noun elided as in the structure (67b), the coordinator should have been ne. Thus the alternative analysis (67b) is excluded for Dāgārē, which supports our conclusion that Dāgārē relative clauses are internally-headed.

In the case of English, the situation is a little more complicated because the coordinator and is used both for nouns and clauses. However, the same point can be made by using the coordinator but. It can conjoin clauses but not noun phrases.

Now if the sentences (45) and (53) were a coordination of noun phrases as represented in the structure (67b), we would expect that a use of but would lead to ungrammaticality. This prediction is not borne out, however.

Thus, it is legitimate to think that the coordinated relative clauses in question do not involve an elided head noun in either language. Therefore, the asymmetry in the coordination of relative clauses between English and Dāgārē shows the asymmetry in the structure: the externally-headed structure for English and the internally-headed structure for Dāgārē.

Let us further consider another alternative analysis that an anonymous reviewer pointed out, in which the entire PP or the entire possessor-possessee NP is an external head in the traditional adjunction analysis or in Bhatt’s (2002) raising and reprojection analysis.

The obvious difficulty is to characterize the proper relation between a higher verb and these complex noun phrases. The analysis of PP relativization (71a) means that the entire category is a PP, which cannot function as an argument in a higher clause. Indeed, such a PP cannot combine with the verb ‘to buy’ without a relative clause to mean ‘I bought the car’, whereas the PP relativization with pied-piping has exactly that interpretation.
The same difficulty arises for the possessor relativization (71b). Again, the noun phrase without a relative clause in the example (73a) only allows the interpretation in which the entire noun phrase is a thematic object of the verb (‘I saw the woman’s book’). In contrast, the one with a relative clause in the example (73b) allows the interpretation in which only the possessor NP1 is a thematic object of the verb. This is unexpected under the head-external analysis as shown in the derivations (74), because in either example, the same noun phrase à póqgó ná in the same position – the direct sister position of the verb,

(73) a. ñ záà dá nyé là à póqgó ná gânè.
   1Sg yesterday Pst see.Perf F D woman Dem book
   ‘I saw the woman’s book yesterday.’ ‘*I saw the woman with a book.’

b. (=51b))
   ñ dá nyé là à póqgó ná ‘(ó) gânè ñ náng sóré dèyâng.
   1Sg Pst see.Perf F D woman Dem 3Sg book 1Sg C read.Perf last.year
   ‘I saw the woman whose book I read last year.’

(74) a.  
   VP
   \[\text{V} \quad \text{NP2}\]
   saw \quad \text{NP1} \quad \text{N2}
   woman \quad \text{book}

b.  
   VP
   \[\text{V} \quad \text{NP2}\]
   saw \quad \text{NP1i} \quad \text{CP}
   woman \quad \text{book}

No such problem arises if the relative clauses are internally-headed even though left-headed in Dágáárè on the surface. In fact, this kind of phenomena are also observed in other Gur languages that allow in-situ HIRCs. In what appear to be clearly in-situ HIRCs (as well as ex-situ HIRCs), possessor relativization and PP relativization are semantically felicitous, as illustrated in the examples (75) and (76) from Bülli (see Hiraiwa, 2005 for extensive discussions about Bülli).20

(75) Bülli: Relativization and pied-piping of P

a. ñ ðá [Àtim àli gwá ló:-dī:y pó lá].
   1Sg buy.Perf Atim C lie.Perf car-Rel in Dem
   ‘I bought the car in which Atim slept.’ (In-situ)

b. ñ ðá [ló:-dī:y àti Àtim gwá di pó lá].
   1Sg buy.Perf car-Rel C Atim lie.Perf 3Sg in Dem
   ‘I bought the car in which Atim slept.’ (Ex-situ)

---

20 See Hiraiwa (2008) for parametric differences between Dágáárè-type languages and Bülli-type languages among Gur languages, and for a theoretical proposal.
4. Typological implications

Having established that relative clauses in Dàgàárè are left-headed HIRCs, we would like to consider some typological implications (see Hiraiwa, in preparation for extensive discussions on cross-linguistic typology of HIRCs).

In the typology of Wh-questions, three types of language have been attested: Wh-in-situ languages, optional Wh-movement languages, and Wh-movement languages.

(77)  


b. Wh-in-situ, Wh-movement: French, Bülü, etc.

c. *Wh-in-situ, Wh-movement: English, Bulgarian, Dàgàárè, etc.

Similarly, there are theoretically three possible types of HIRCs permitted by a parametric theory. There are languages that only allow in-situ HIRCs. There are also languages that allow both in-situ and ex-situ HIRCs. However, the third-type, a language that only allows ex-situ HIRCs (i.e. left-headed HIRCs), has been unattested in the previous literature. As we have shown, Dàgàárè bridges this missing gap in the typology of HIRCs.

(78)  

a. in-situ HIRCs, *ex-situ HIRCs: Navajo, etc.

b. in-situ HIRCs, ex-situ HIRCs: Diegueño, Bülü, etc.

c. *in-situ HIRCs, ex-situ HIRCs: Dàgàárè

If we include HERCs, we obtain the following typology.

(79)  

<table>
<thead>
<tr>
<th>Typology of relative clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left-Headed</td>
</tr>
<tr>
<td>Head-External</td>
</tr>
<tr>
<td>Head-Internal</td>
</tr>
</tbody>
</table>

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Let us touch on the two gaps in the chart (79). First, right-headed HIRCs should be in principle absent as long as specifiers are always located at the left-hand branch universally (Kayne, 1994; Chomsky, 1995). Thus the structure (80) is not possible under this assumption.

(80) Right-headed HIRC

\[
\begin{array}{c}
\text{DP} \\
D \quad \text{CP} \\
\text{C'} \quad \text{NP}_1 \\
\text{C} \quad \text{TP} \\
\cdots \quad t_1 \quad \cdots
\end{array}
\]

However, it is still technically possible to have right-headed HIRCs under this assumption. Suppose that the relativized head noun moves leftward to [Spec, CP] as we have seen in Da`ga´are`. Now suppose that the TP undergoes a remnant movement to a higher position. This derivation is illustrated below.

(81) Right-headed HIRC

a. \[
\begin{array}{c}
\text{DP} \\
\text{D} \quad \text{NP}_1 \quad \text{C'} \quad \text{TP} \\
\text{C} \quad \cdots \quad t_1 \quad \cdots
\end{array}
\]

b. \[
\begin{array}{c}
\text{DP} \\
\text{D'} \quad \text{TP} \\
\text{C'} \quad \text{D} \quad \text{NP}_1 \\
\text{C} \quad \cdots \quad t_j \quad \cdots
\end{array}
\]

In fact, this is the way to derive right-headed relative clauses in Kayne’s theory. As long as such TP movement is shown to be possible, we would expect right-headed HIRCs. The prediction is at least not borne out in Japanese. Japanese allows HIRCs as well as right-headed/prenominal relative clauses (Kuno, 1973; Kuroda, 1992). Now recall the Diegueño data in Section 1: Case-marking provides a direct clue about where a relativized head noun is located. Now in the HIRC example (82a), the relativized head noun \textit{ringo} ‘apple’, being the subject in the relative clause, must take nominative Case-marking. In contrast, in the right-headed relative clause (82b), the same relativized head must take accusative Case-marking, which comes from the higher verb \textit{tabe} ‘to eat’. This demonstrates that right-headed relative clauses in Japanese can never be internally-headed.

(82) Japanese

a. [teeburu-no ue-ni \textit{ringo}-ga/*o oiteat-ta no]-o tabe-ta.
\text{table-Gen on-Loc apple-Nom/Acc put-Pst C-Acc eat-Pst}
\text{‘I ate the apple that had been put on the table.’} \quad \text{(HIRC)}

b. [[teeburu-no ue-ni $t_i$ oiteat-ta] \textit{ringo}]-o/*ga tabe-ta.
\text{table-Gen on-Loc put-Pst apple-Acc/Nom eat-Pst}
\text{‘I ate the apple that had been put on the table.’} \quad \text{(Right-headed HERC)}

The other gap in the chart (79), internally-headed head-external relative clauses, is more straightforward. It is theoretically predicted to be impossible because a relative clause cannot be internally- and externally-headed at
the same time, and indeed, to the best of our knowledge, no one has argued for this type of relative clause so far.\footnote{Grosu and Landman (1998) and Grosu (2002) argue that HIRCs come in (at least) two types: the restrictive type and the maximalizing type. They argue that the latter excludes an existential reading and disallows stacking. Dágávê relative clauses do not stack. However, they do not exclude an existential interpretation.}

(83) *Internally-headed HERC  
\[ \cdots H_{\text{Case}\alpha} \cdots \] \cdots V/T_{\text{Case}\alpha} \]

5. Conclusions and further issues

In conclusion, the availability of pied-piping in PP and possessor relativization shows that what looks like an externally-headed relative clause in Dágávê is indeed internally-headed, with the relativized head noun moved to the left edge but still remaining clause-internal. We have argued that the head obligatorily moves to [Spec, ForceP] just as a Wh-phrase does. Dágávê is different from the languages that Basilico (1996) discusses in that the movement is obligatory and not a scrambling. This is corroborated by the absence of scrambling in the language and by the fact that the language is an obligatory Wh-fronting language as we have seen in Section 2.\footnote{Under this analysis, one might wonder if two instances of \( \hat{a} \) might co-occur in a relative clause, one for the CP and the other for the internal head noun. The expectation fails, however.}

Watanabe (2004) refutes the face-value correlation between HIRCs and Wh-in-situ (cf. Watanabe, 1991) based on Quechua and instead links the availability of HIRCs in Quechua to the availability of focus-in-situ. However, it is still not unreasonable to think that Wh-movement and the movement of the head noun of HIRCs utilize the same mechanism, as Watanabe (2004, 2006) argues. If so it is not surprising that the head noun in Dágávê always appears at the left periphery internal to CP, although we have to leave open a fine-grained parametric theory of HIRCs.

We have demonstrated that Dágávê presents a new type of HIRC, called left-headed HIRC and this opens up a possible reconsideration of the facts of relative clauses in other languages in the light of this syntactic derivation. This is important in two respects. First, this type of ex-situ HIRCs has not been observed in the literature. Second, it suggests a totally new picture of the typology of HIRCs (cf. Gorbet, 1977; Cole, 1987; Culy, 1990) and a careful re-examination of the relative clauses that have been simply assumed to be HERCs. Furthermore, it provides another piece of evidence against Cole’s Generalization (Cole, 1987) that HIRC is restricted to languages with null pronouns and SOV word order (see also Culy, 1990; Hiraiwa, 2008, in preparation): Dágávê neither allows null pronouns nor shows SOV word order. Needless to say, Cole’s generalization was based on in-situ HIRCs, but a theory incorporating both in-situ and ex-situ HIRCs must be pursued in the future.

\footnote{We have to leave for future research a in-depth investigation of the semantics of HIRCs and its typology.}

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