Externally and internally headed relative clauses in Marori

I Wayan Arka
Australian National University
Universitas Udayana

This paper discusses relative clauses (RCs) in Marori (ISO 639-3: mok; a subgroup-level isolate, TNG/Papuan, highly endangered, around a dozen of fluent speakers). This should provide rich empirical evidence on the characteristics and constraints of co-existing externally and internally headed relative clauses and contribute to linguistic typology and the theoretical analysis of relative clauses (Culy 1990, Grosu 2012 and the references therein), and of how precisely a lexically-based framework like Lexical-Functional Grammar (LFG) and Head-driven Phrase Structure Grammar (HPSG) can handle different kinds of RCs.

The complexity of RCs in Marori comes from their RC marking and the related, wider morphosyntactic and semantic behaviour. The RC markers—*kefi/kei/ki* (REL.SG), *kemnde* (REL/NSG), and *keme* (REL)—are also locative demonstratives, functioning as part of a complex four-way deictic system (speaker-proximal, hearer-proximal, semi-distal, and distal). The structural properties of deixis and other properties of RCs as adjuncts are responsible for an intriguing complexity of Marori RCs. They call for a sophisticated and integrated approach to account for the morphosyntax and semantics structure involved.

Marori is perhaps unusual as far as its relative clause typology (RCs) is concerned. It has almost all of relative clause types: headed and headless RCs, externally and internally headed RCs, single- and double- headed RCs, pre- and post-head RCs, as well as detached RCs or co-relatives. In addition, all relations from arguments (subject and object) to adjuncts are possibly relativized. Internally headed relative clauses (IHRCs) are highly constrained and may give rise to ambiguity, if out of context. However, there is an intriguing definiteness constraint which can disambiguate them. The constraint of IHRCs in Marori can be accounted for in terms of Grosu's (2012) semantic typology of RCs; that is, IHRCs in Marori are essentially of the restrictive type, having non-specific indefinite force.

Here, I will describe the salient features of RCs in Marori and sketch out an analysis using LFG (Bresnan et al. 2015, Dalrymple 2001). The proposed analysis is easily transferable to HPSG.

The morphosyntactic-semantic properties of Marori RCs are illustrated by sentence (1). This is an internally headed RC (IHRC) where the object and the dative argument can be equally relativized, leading to ambiguity. In this example, the relativized argument is case-marked by the relative clause predicate.

1   [Keme na njaj=i samagau ngge terme-ben]   tamba keiwei nggu-f
    REL   1SG bench=U club   with 3SG.O.M.hit-1SGNrPSTPERF damaged 3SG.M.U.AUX -NrPST
    a) 'The bench that I hit with the club is damaged.'
    b) 'The club with which I hit the bench is damaged.'

Sentences (2a) illustrates an externally headed RC (EHRC). Sentence (2b) shows a discontinuous (or co-relative) structure in which the RC is detached from its head noun. The whole RC cannot be case-marked, however, as shown by the unacceptability of (2c).

2   a. Na   tomo-bon   efi purfam=i   [kefi   bosik=i   nde-n]RC
        1SG   3SG.call-1NPL.NrPSTthis person =U REL.SG pig=U   3SG.M.U.bring-3NPL.A.NrPST
        'I called the person who brought a/the (male) pig. '

    b. Na   efi   purfam=i   tomo-bon   [kefi   bosik=i nde-n]RC
        1SG   DEF   this person=U 3SG.call -1NPL.NrPST REL.SG bring=U 3SG.M.U.bring -3NPL.A.NrPST
        'I called the person who brought a/the (male) pig.'
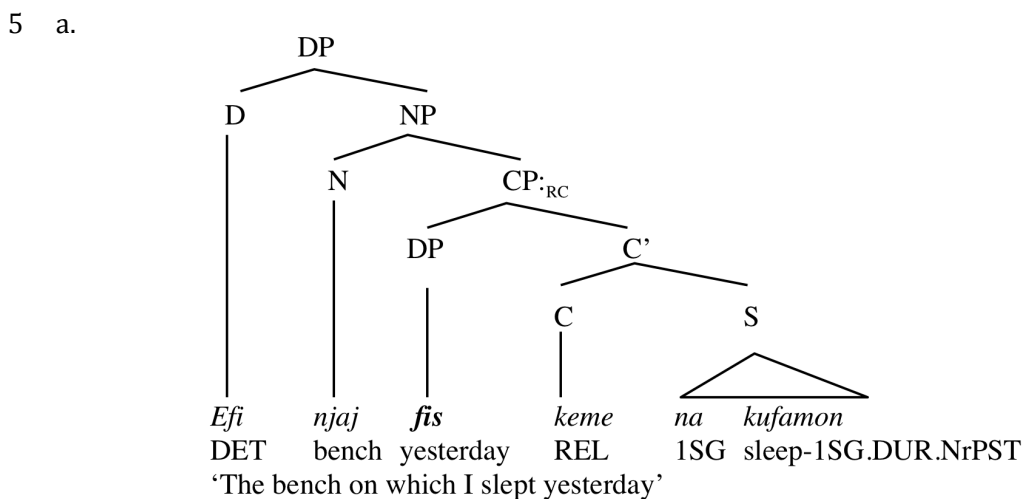
c.* Na   tomo-bon   [[efi purfam] kefi   bosiki   nde-n]=i
    1SG   3SG.call-1NPL.A.NrPST this person   REL.SG   pig =U   3SG.M.U.bring -3NPL.A.NrPST
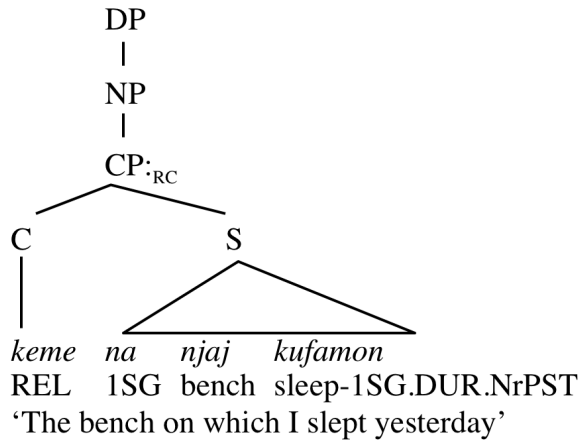   'I called the person who brought a/the (male) pig here'.

       All syntactic dependants (subject, object, obliques, and adjuncts) can be relativized in Marori. Of particular interest is the relativization of an oblique or adjunct, given in examples (3)-(4). This grammatical relation must be flagged by a postposition in independent clauses, as seen by the obligatory *ke/uyowe* in (3a), but when relativized, it loses its postpositional flagging, and *ke/uyowe* is dropped (3b). This kind of categorial PP-NP mismatch between the antecedent matrix NP head and its embedded relativized dependent (gap) in RCs cannot be strictly accounted for in terms of a surface categorial filler and gap relationship; rather, this is explained in terms of a deeper dependency, involving a referential INDEX feature (see the RC analysis below). However, it should be noted that a postposition can be left stranded in the RC, as seen in (4b).

3   a.   Na   fis   njaj   *(ke/uyowe)   kufa-mon
          1SG   yesterday   bench   LOC/ON   sleep-1SG.A.NrPST
          'I slept on the table.'

      b.   Efi   njaj   [fis   keme=na   kufa-mon]   tamba   rafonngin
          DEF.SG   bench   yesterday   REL=1SG   sleep-1SG.A.NrPST   PERF   broken
          'The table on which I slept yesterday is already broken.'

4   a.   Na   [sendok   ngge]PP   korya   kafra-mon.
          1SG   spoon   with   food   consume-1SG.NrPST
          'I ate (the) food with the spoon.'

      b.   Sendok   [keme   na   ngge   kafra-mon]RC   tamba   kobya   ngguf
          spoon   REL   1SG   with   consume-1SG.NrPST   already missing   AUX.NrPST
          'The spoon that I ate (the) food with was missing.'

       To capture the intriguing properties of RCs in Marori, I propose the c-str of the EHRC and IHRC, the entry of the relativiser, the functional annotations as well as the related constraints involved. Regarding the c-str, empirical evidence shows that the RC in Marori has an extended clause structure of CP as shown in (5a). The relativiser (*ki/kefi/keme*) is in C position, projecting a relative clause structure CP with the [Spec, CP] position possibly filled in by an adjunct. This position is a phrasal unit, realised by a single word, such as *fis* ('yesterday'), as in (3), or a phrase, as in (6). The relativizer, while categorially a C, is analysed as a type of relative pronoun, hence the notation of C in its entry shown in (7). It carries a referential index, imposing agreement with the relativized noun. It also has its own (optional) PRED. This is to capture that fact that Marori has a headless RC in which case the relativizer itself is referential. For the EHRC, the relativised (head) noun is outside the CP, carrying a referential index agreeing with the relativiser. An internally headed relative clause (IHRC) has the same CP structure but it is part of a DP without its head D (and without the noun head of the NP). The c-str of the IHRC counterpart is given in (5b).

5   a.

          Efi   *njaj*   **fis**   *keme*   *na   kufamon*
          DET   bench   yesterday   REL   1SG   sleep-1SG.DUR.NrPST
          'The bench on which I slept yesterday'

b.

DP
|
NP
|
CP:_{RC}

(tree: CP:RC branches to C and S)

C   S

keme   na   njaj   kufamon
REL   1SG   bench   sleep-1SG.DUR.NrPST
'The bench on which I slept yesterday'

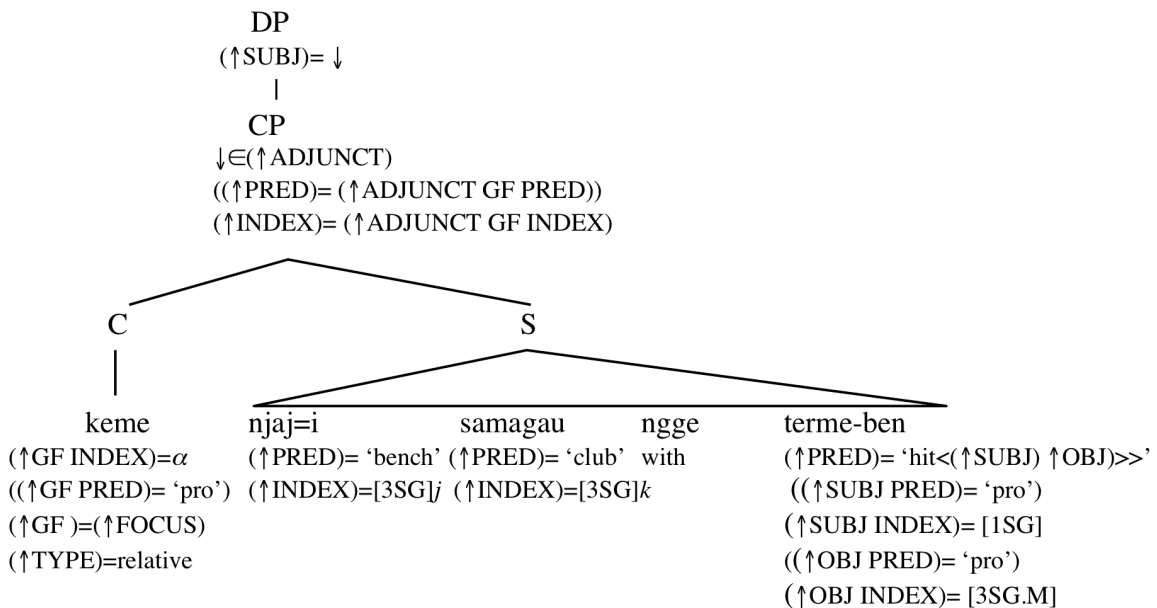6   Efi   njaj   [kyene   pyang   keme=na   kufamon]   tamba   rafonnggin
     DEF.SG   bench   two.days.ago   night   REL=1SG   sleep-1SG.DUR.NrPST   PERF   broken
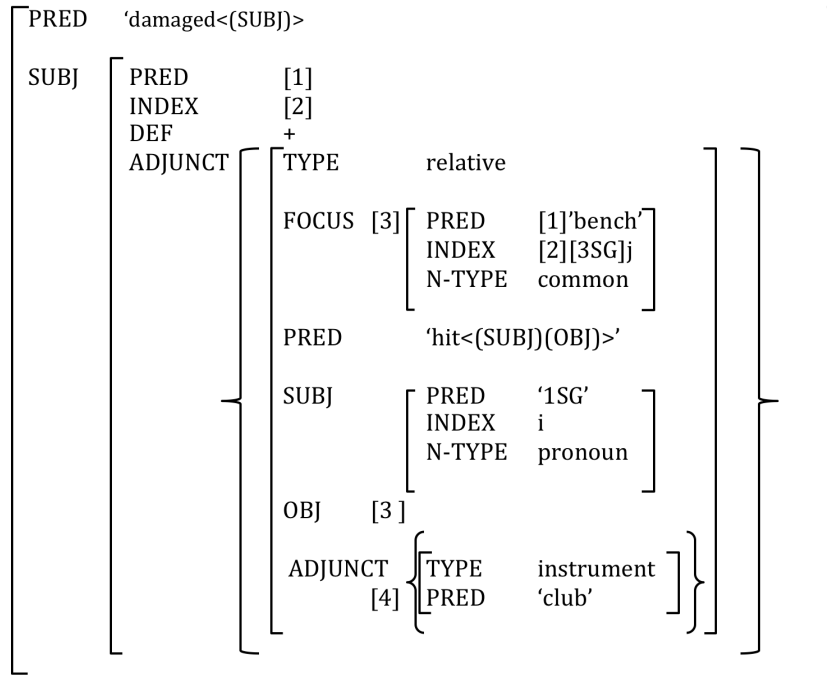   'The[traditional] bench that I slept on two nights ago is already broken.'

7   a.   *keme*   C   ($\uparrow$GF INDEX)= [ ]α b. *kefi*   C   ($\uparrow$GF INDEX)= [SG]α
                               (($\uparrow$GF PRED)='pro')   (($\uparrow$GF PRED)='pro')
                               ($\uparrow$TYPE)=relative   ($\uparrow$TYPE)=relative
                               ($\uparrow$GF)=($\uparrow$FOCUS)   ($\uparrow$GF)=($\uparrow$FOCUS)

The top node of the RC (the CP) carries a set of annotations to ensure that the whole unit is functionally an adjunct and that the matrix DP picks up its referential information available from the embedded IHRC. As an illustration, consider sentence (1) with IHRC whose partial annotated c-str is given in (8a). The $\downarrow\in$($\uparrow$ADJUNCT) equation on C in (8a) ensures that the RC is an ADJUNCT. The optional equation of ($\uparrow$PRED)= ($\uparrow$ADJUNCT GF PRED) ensures that the relativized nominal (DP) has its semantic content. That is, in IHRC, the matrix DP selects its PRED value from any GF of the ADJUNCT in the RC. The selection is constrained by the agreement, imposed by the equation of ($\uparrow$INDEX)= ($\uparrow$ADJUNCT GF INDEX). The equation ($\uparrow$PRED)= ($\uparrow$ADJUNCT GF PRED) is optional because the PRED value can be supplied by the matrix DP in the case of EHRCs in which case there is no need to have it from inside the embedded RC.

8   a.

DP
($\uparrow$SUBJ)= $\downarrow$
|
CP
$\downarrow\in$($\uparrow$ADJUNCT)
(($\uparrow$PRED)= ($\uparrow$ADJUNCT GF PRED))
($\uparrow$INDEX)= ($\uparrow$ADJUNCT GF INDEX)

(tree: CP branches to C and S)

C   S

keme   njaj=i   samagau   ngge   terme-ben
($\uparrow$GF INDEX)=α ($\uparrow$PRED)= 'bench'   ($\uparrow$PRED)= 'club'   with   ($\uparrow$PRED)= 'hit<($\uparrow$SUBJ) $\uparrow$OBJ)>>'
(($\uparrow$GF PRED)= 'pro')   ($\uparrow$INDEX)=[3SG]*j*   ($\uparrow$INDEX)=[3SG]*k*   (($\uparrow$SUBJ PRED)= 'pro')
($\uparrow$GF)=($\uparrow$FOCUS)   ($\uparrow$SUBJ INDEX)= [1SG]
($\uparrow$TYPE)=relative   (($\uparrow$OBJ PRED)= 'pro')
                                                                      ($\uparrow$OBJ INDEX)= [3SG.M]

b.

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⎡ PRED    'damaged<(SUBJ)>'                                                          ⎤
⎢                                                                                    ⎥
⎢ SUBJ  ⎡ PRED      [1]                                                          ⎤   ⎥
⎢       ⎢ INDEX     [2]                                                          ⎥   ⎥
⎢       ⎢ DEF       +                                                           ⎥   ⎥
⎢       ⎢ ADJUNCT ⎡ TYPE      relative                                     ⎤    ⎥   ⎥
⎢       ⎢         ⎢                                                         ⎥    ⎥   ⎥
⎢       ⎢         ⎢ FOCUS [3] ⎡ PRED    [1]'bench'  ⎤                       ⎥    ⎥   ⎥
⎢       ⎢         ⎢           ⎢ INDEX   [2][3SG]j   ⎥                       ⎥    ⎥   ⎥
⎢       ⎢         ⎢           ⎣ N-TYPE  common      ⎦                       ⎥    ⎥   ⎥
⎢       ⎢         ⎢ PRED      'hit<(SUBJ)(OBJ)>'                            ⎥    ⎥   ⎥
⎢       ⎢         ⎢                                                         ⎥    ⎥   ⎥
⎢       ⎢         ⎢ SUBJ    ⎡ PRED    '1SG'    ⎤                            ⎥    ⎥   ⎥
⎢       ⎢         ⎢         ⎢ INDEX   i        ⎥                            ⎥    ⎥   ⎥
⎢       ⎢         ⎢         ⎣ N-TYPE  pronoun  ⎦                            ⎥    ⎥   ⎥
⎢       ⎢         ⎢ OBJ     [3]                                             ⎥    ⎥   ⎥
⎢       ⎢         ⎢ ADJUNCT   { ⎡ TYPE   instrument ⎤ }                     ⎥    ⎥   ⎥
⎢       ⎢         ⎣   [4]     { ⎣ PRED   'club'      ⎦ }                     ⎦    ⎦   ⎥
⎣                                                                                    ⎦
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The agreement holds between the noun head and the relativiser as well as with the verb if the relativised noun bears a subject or object. In example (1), there are three GFs in the RC (SUBJ, OBJ, and ADJUNCT); each of them can be selected but SUBJ '1SG' is excluded due to the agreement feature clash with the matrix verb (and also due to the semantic constraint, discussed below). The other two, OBJ 'bench' and ADJUNCT 'club', have no agreement feature clash. Both are therefore possibly selected, giving rise to the ambiguity. This can be captured nicely by the proposed LFG analysis here. The selection of OBJ (i.e., reading (a)) is shown by the f-str in (8b). As seen, the relativised OBJ in the RC is also FOC in terms of its information structure (tag [3]). This information structure identification comes from the entry of the relativiser shown in (5). Its information associated with semantic content, its PRED and INDEX (tags [1] and [2]), is shared with the matrix GF (which happens to be SUBJ). This information sharing is imposed by the annotation on C as discussed earlier.

On the basis of the semantic typology of IHRCs proposed by Grosu (2012), IHRCs in Marori belongs to the restrictive type. Salient to the restrictive RC is its non-specific indefinite force. Evidence for this in Marori comes from the fact that it is possible to stack IHRCs to provide further intersective specifications to make the denotation more specific, as seen in (9). In addition IHRCs do not presuppose a definite or specific denotation at the matrix level. The relativised noun can, however, have its overt D (Determiner) outside the RC, as exemplified in (10).

9   Na   fis   purfam=i   eyew=nda-mon
         1SG   yesterday person=U   eye=3.AUX-1SG.NrPST

         [kefi   koro   imbirif   [kefi   kundo-f]]
         REL   dog   bite-NrPST REL   run-3NrPST

         'I was looking for (the/a) person [that dog bit [that ran away]]

10   [[keme   na   fis   **ujif**   ndon-du]_{RC}]_{NP}   **efi**   (IHRC)
         REL   1SG   yesterday bird   3SG.F bring.here-1SG.PRES that

         tamba   yaba   nggwo-f
         already dead   AUX3SG.F-NrPST

         'The female bird that I brought here yesterday already died.'

This restrictive semantic property appears to be responsible for the intriguing definiteness constraint that can disambiguate meaning. Thus, sentence (11) can only have reading (i), relativising the actor 'people' and not the quantified NP 'all the students' because of the definite denotation of the quantified NP. (The theme 'money' is excluded on the semantic ground; i.e. 'money' is inanimate and it does not make sense for it to go by itself.) Likewise, a proper name or a free pronoun cannot be selected for the relativisation in the IHRC; hence no ambiguity arises (12). Relativisation of a pronoun is only possible by means of a double-headed RC as seen in (13a). Dropping the RC-external pronoun na downgrades the acceptability of the sentence (13b). Sentence (13b) cannot have reading (ii) (with the relativisation of the undergoer 'pig'), due to the clash of the agreement features with the matrix verb.

11 Kemde   usindu   meninggon=i   purfam   paar   njemba-b   tamba   sra-f
    REL   all   child.PL=U   person   money   3.give-3PL.NrPST already   go.PL-NrPST
    i) 'The people who gave money to all the children already went away.'
    ii) * 'All the children who were given money by the people already went away.'

12 [Keme   Markus   bosik =i   ife -f]$_{IHRC}$ tamba   kundo -f
    REL   Markus   pig =U   3SG.M.see-3NPL.NrPST   PERF   run-3SG.NrPST
    i)   'The pig that Markus saw ran off.'
    ii) * 'Markus who saw the pig ran off.'

13   a.   keme   **na**   a bosik=i   ife-ben   tamba**=na**   kundo-bon
           1SG   REL   pig=U   3SG.M.see-1SG.NrPST   PERF=1SG   run-1SG.NrPST
           'I who saw the pig (I) ran off'

     b. * keme   na   bosik=i   ife-ben   tamba   kundo-bon
          1SG   REL   pig=U   3SG.M.see-1SG.NrPST   PERF   run-1SG.NrPST
          i) NOT FOR 'I who saw the pig ran off'
          ii) NOT FOR 'The pig which I saw ran off.'

This paper has described the morphosyntactic and semantic intricacy of relative clauses in Marori. Marori has almost all of the RC types, but there is still a question about the actual distribution of different kinds of RCs. A preliminary observation suggests that there seems to be a preference for discontinuous post-verbal RCs, as in (2b). This seems to be in line with the finding reported in the literature that the reduction of preverbal argument NPs in SOV languages is a compensatory strategy to reduce the heavy cost in production and comprehension (Hawkins 2004, Ueno and Polinsky 2009, and the references therein). Further research should include an in-depth corpus investigation of Marori, preferably including comparison with (OV/VO) languages with IHRCs, to gain further empirical evidence for the analysis proposed.

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