Symmetric objects in Moro[1]

Farrell Ackerman (University of California, San Diego)
Rob Malouf (San Diego State University)
John Moore (University of California, San Diego)

The existence of languages with NP constituents that can all simultaneously display syntactic object properties has been documented for a long time and has been attested in several different language families (Duranti, 1979, Kimenyi, 1980, Baker, 1988, Bresnan and Moshi, 1990, Alsina, 1996, 2001, Beck, 2006, Marten et al., 2007, McKay and Trechsel, 2008, Citko, 2011, Baker et al., 2012, Marten and Kulab, 2012, among others). The phenomenon has been addressed by different grammatical theories that all subscribe to an ensemble of assumptions:

(1) i. all languages map arguments into a finite inventory of grammatical functions such as SUBJECT and OBJECT or distinct structural positions,
ii. each distinct grammatical function or structural position corresponds to a distinct semantic argument, and
iii. each pairing of grammatical function/structural position and semantic role can be represented only once per clause.

Theories like Relational Grammar, Lexical Functional Grammar, and Principles & Parameters or Minimalism have well-established architectural assumptions designed to reflect assumptions (1i–iii). Each has developed (several) theory specific treatments, adapting their inventories of explanans, to address that departure from (1i–iii) whereby multiple complements of a predicate concurrently exhibit behaviors diagnostic of object status. In contrast, comparatively little research, if any, in HPSG has been devoted to this phenomenon of avid interest in other frameworks.

In this paper we argue that, since none of these assumptions are foundational characteristics of HPSG, the basic architecture of the framework is trivially adapted to accommodate the data distributions in symmetrical languages. We demonstrate this with evidence from an underdocumented Kordofanian language, the Thetogovela dialect of Moro, spoken in the Nuba mountains of Sudan.

Moro has a basic SVO* word order and an extremely complex verbal structure, partially provided in the following verbal template:

(2) (SM)-CL-CLAUSE.TYPE-(OM)-STEM-(DIST)-(CAUS)-(APPL)-(PASS)-ASP.MOOD-(OM)-(OM)

The relevant properties of Moro direct objects are demonstrated in (3):

(3) a. kúku g-a-ləvətʃ-ó ɲogopájá
CLg.Kuku CLg.SM-MAIN-hide-PFV CLɲ.cup
'Kuku hid the cups.'
b. ŋálːo g-ʌrːʌŋətʃ-ú kúku-ŋ
CLg.Ngallo CLg.SM-teach-PFV CLg.Kuku-ACC
'Ngallo taught Kuku.'

Moro shows basic SVO order, as in (3a). When the object is realized by a proper name, it optionally bears the accusative case suffix *–ŋ,* while the co-occurring subject never does, as in (3b). Other types of direct objects display no distinct morphological marking.

The nouns are partitioned into approximately 24 classes and class membership is reflected in prefixes on the nouns and concord markers on agreeing categories such as verbs and adjectives (Gibbard et al., 2009). Nouns can co-occur with pre-nominal and post-nominal affixes (and particles) to convey a number

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of spatial and case relations. While agreement prefixes on verbs reflect the person/number/noun class properties of the subject, object arguments with pronominal status are realized by inflectional markers on the verb. These markers reflect person/number properties of the object, but not noun class:

(4) a. kúku g-a-ləvətʃ-ə́-**lo**
CLg.Kuku CLg.SM-MAIN-hide-PFV-**3PL.OM**
'Kuku hid them.'

b. *kúku g-a-ləvətʃ-ə́-**lo** ɲogopájá
CLg.Kuku CLg.SM-MAIN-hide-PFV-**3PL.OM** CLɲ.cup

As shown in (4b), the pronominal markers appear in complementary distribution to full NP objects (cf. Bresnan and Mchomobo (1987) on Chicheŵa). Finally, direct objects can be promoted to subject via the passive construction, indicated on the verb by the passive suffix *-ən* in (5):

(5) ɲogopájá ɲ-ʌ-ləvətʃ-ən-ú
CLɲ.cup CLɲ.SM-MAIN-hide-PASS-PFV
'The cups were hidden.'

For three place predicates in Moro, both of the verb's internal arguments show the properties of direct objects. Either can immediately follow the verb (6a), either or both may show accusative marking (6b), either or both may be expressed by a pronominal suffix on the verb (6c) and (6d), and either may be promoted to subject by the passive construction (6e):

(6) a. é-g-a-natʃ-ó óráŋ ŋerá
1SG.SM-CLg-MAIN-give-PFV CLg.man CLŋ.girl
'I gave the girl to the man.' / 'I gave the man to the girl.'

b. é-g-a-natʃ-ó ŋál:o-ŋ kóʤa-ŋ
1SG.SM-CLg-MAIN-give-PFV CLg.Ngallo-ACC CLg.Kodja-ACC
'I gave Ngallo to Kodja.' / 'I gave Kodja to Ngallo.'

c. é-g-a-natʃ-ə́-lo ŋerá
1SG.SM-CLg-MAIN-give-PFV-3PL.OM CLŋ.girl
'I gave them to the girl.' / 'I gave the girl to them.'

d. é-g-a-natʃ-ə́-**ŋó-lo**
1SG.SM-CLg-MAIN-give-PFV-**3SG.OM-3PL.OM**
'I gave him to them.'/'I gave them to him.'

e. óráŋ g-ʌ-nʌtʃ-ən-ú ów:á
CLg.man CLg.SM-MAIN-give-PASS-PFV CLg.woman
'The man was given a woman.' / 'The man was given to a woman.'

In (6d) the object markers are ordered according to a person and number hierarchies. Note that the sentence is ambiguous – hence, object marker order has no bearing on which pronominal bears which semantic role (Ackerman, 2009, Ackerman et al., 2010).

Based on these facts, there is no syntactic reason to assume that one of the internal complements is a direct object and the other is an indirect object or an oblique; both arguments equally show the behavior of a direct object. In this sense, Moro is a **symmetric** language (Dryer, 1986, Haspelmath, 2005).

This same pattern follows for derived three-place predicates, such as causatives and applicatives:

(7) a. k-ʌ-bug-í ŋál:o-ŋ kúku-ŋ
mclg.SM-MAIN-hit-CAUS.PFV CLg.Ngallo-ACC CLg.Kuku-ACC
'He made Ngallo hit Kuku.' / 'He made Kuku hit Ngallo.'

b. k-ʌ-w:ʌð-iṯ-ú ŋerá um:iə
CLg.SM-MAIN-find-APPL-PFV CLŋ.girl CLg.boy
'He found the boy for the girl.' / 'He found the girl for the boy.'

Either of the NPs following the verb can be interpreted as the patient, either (or both) can carry accusative marking, either can be expressed via a pronominal suffix on the verb, and either can become the subject in a passive construction. Going even further, under certain circumstances combinations of these yield sentences with three symmetric internal arguments:

(8) í-g-ʌ-nʌʤ-ət̪-ú aljásər-o kúku-ŋ ŋál:o-ŋ
1SG.SM-CLg-MAIN-give-APPL-PFV CLg.Elyasir-ACC CLg.Kuku-ACC CLg.Ngallo-ACC

'I gave { Elyasir to Kuku for Ngallo / Elyasir to Ngallo for Kuku / Kuku to Elyasir for Ngallo / Kuku to Ngallo for Elyasir / Ngallo to Kuku for Elyasir / Ngallo to Elyasir for Kuku }.'

In (8), all three of the internal arguments show the full range of direct object properties.

As mentioned above, symmetric languages pose a problem for theoretical frameworks (such as Relational Grammar or Lexical Functional Grammar) which assume some version of functional uniqueness. In HPSG, on the other hand, grammatical functions like 'direct object' are not first-class theoretical constructs. Instead, the hierarchical syntactic relations among arguments of a verb are expressed by the ARG-ST list.

For familiar asymmetric languages, the ARG-ST is a totally-ordered list: subject precedes direct object, which precedes indirect object, which precedes various adjuncts and obliques. This ordering is in general well supported by the facts of asymmetric languages, though the relative ordering of adjuncts is not always clear. For a symmetric language like Moro, however, there is little or no language-internal evidence to support any relative ordering of the internal arguments. We can transparently capture that intuition by generalizing the ARG-ST representation for symmetric languages to a (strict) partially ordered set. For a verb like *natʃ* 'give', the first argument, the subject, precedes the two internal arguments, but the remaining arguments are unordered with respect to each other:

(9) $\begin{bmatrix} \text{ARG-ST} & \text{NP}_i \prec \{\text{NP}_j, \text{NP}_k\} \\ \text{SEM} & \begin{bmatrix} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{bmatrix} \end{bmatrix}$

This modification to the ARG-ST then requires a slight reformulation to the Argument Realization Principle of Bouma et al. (2001):

(10) **Argument Realization Principle**

$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \boxed{2} \end{bmatrix} \\ \text{ARG-ST} & \boxed{3} \end{bmatrix} \rightarrow \langle \boxed{1} \rangle \oplus \boxed{2} \text{ is a linear extension of } \boxed{3}$$

where a total order $<$ is a **linear extension** of a strict partial order $\prec$ on X if and only if for every x and y in X, if $x \prec y$ then $x < y$. In the case of asymmetric languages, the ARG-ST will be a total order, and (10) is equivalent to the usual formulation of the Argument Realization Principle. But, in the case of a symmetric language, (10) will be consistent with multiple mappings between ARG-ST and COMPS. Specifically, combining (9) with (10) yields:

(11)
$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{3}, \boxed{2} \rangle \end{array}\right] \\ \text{ARG-ST} & \boxed{1}\text{NP}_i < \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right] \text{ or } \left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2}, \boxed{3} \rangle \end{array}\right] \\ \text{ARG-ST} & \boxed{1}\text{NP}_i < \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right]$$

This accounts for the alternative orderings of the patient and theme seen in (6a).

Pronominal object marking, as in (4a), can be expressed using a lexical device similar to ones that have been proposed for Romance clitics (e.g., Miller and Sag (1997), Monachesi (2005)):

(12) **Object Pronominal Lexical Rule**

a. $$\left[\begin{array}{ll} \text{COMPS} & \langle \boxed{1}\text{NP} \rangle \oplus \boxed{2} \\ \text{ARG-ST} & \langle \ldots, \boxed{1}, \ldots \rangle \end{array}\right] \Rightarrow \left[\begin{array}{ll} \text{COMPS} & \boxed{2} \\ \text{ARG-ST} & \langle \ldots, \boxed{1}\text{NP}_{pro}, \ldots \rangle \end{array}\right]$$

b. $$\left[\begin{array}{ll} \text{COMPS} & \langle \boxed{1}\text{NP}, \boxed{2}\text{NP} \rangle \oplus \boxed{3} \\ \text{ARG-ST} & \langle \ldots \{\boxed{1}, \boxed{2}\} \ldots \rangle \end{array}\right] \Rightarrow \left[\begin{array}{ll} \text{COMPS} & \boxed{3} \\ \text{ARG-ST} & \langle \ldots \{\boxed{1}\text{NP}_{pro}, \boxed{2}\text{NP}_{pro}\} \ldots \rangle \end{array}\right]$$

This rule removes the first (and optionally second) complement from the COMPS list, with the appropriate change in the verb's morphological form. Since either the patient or theme may be the first complement, either or both arguments can be pronominalized by this rule (see 6c).

The ambiguity of passive sentences like (6e) also follow directly from our proposed representation. The Passive Lexical Rule of Sag et al. (2003) removes the subject from the ARG-ST, leaving the remaining arguments to be mapped into valence features by the Argument Realization Principle:

(13) **Passive Lexical Rule**

$$\left[\text{ARG-ST} \quad \langle \boxed{1} \rangle \oplus \boxed{2}\right] \Rightarrow \left[\text{ARG-ST} \quad \boxed{2}\right]$$

Applying (13) to (9) produces:

(14)
$$\left[\begin{array}{ll} \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right]$$

By (10), either the theme or the patient could be realized as the SUBJ:

(15)
$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle \boxed{3} \rangle \end{array}\right] \\ \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right] \text{ or } \left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{3} \rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \end{array}\right] \\ \text{ARG-ST} & \{\boxed{2}\text{NP}_j, \boxed{3}\text{NP}_k\} \\ \text{SEM} & \left[\begin{array}{ll} \textit{give\_rel} & \\ \text{AGENT} & i \\ \text{THEME} & j \\ \text{PATIENT} & k \end{array}\right] \end{array}\right]$$

This allows either the patient or the theme to be subject of a ditransitive passive verb.

A final syntactic asymmetry that is often used to motive argument precedence is the behavior of bound anaphora. In Moro, bound anaphora is indicated with *ej* 'every' + N, followed by N + *é*-CL-*oŋ* = CL-*oŋ* 'own', with noun class concord between the possessed noun and 'own'. As (16) shows, the 'every' phrase must precede the 'own' phrase:

(16) a. ej um:iə g-ʌ-bug-ú ðamala éðoŋ = ðoŋ
every CLg.boy CLg.SM-MAIN-hit-PFV CLð.camel CLð.own
'Every boy$_i$ hit his$_i$ camel.'

b. ðamala éðoŋ = ðoŋ ð-ʌ-bug-ú ej um:iə
CLð.camel CLð.own CLð.SM-MAIN-hit-PFV every CLg.boy
'His$_i$ camel hit every boy$_{*i}$.'

And, shown in (17), the first complement of a ditransitive can bind the second but not vice versa:

(17) a. é-g-a-natʃ-ó ej um:iə ðamala éðoŋ = ðoŋ
1SG.SM-CLg-MAIN-give-PFV every CLg.boy CLð.camel CLð.own
'I gave every boy$_i$ his$_i$ camel.'

b. é-g-a-natʃ-ó ðamala éðoŋ = ðoŋ ej um:iə
1SG.SM-CLg-MAIN-give-PFV CLð.camel CLð.own every CLg.boy
'I gave his$_i$ camel to every boy$_{*i}$.'

Either argument may be interpreted as the patient or theme (so long as the result has a plausible meaning), but the pronominal must follow its binder:

(18) í-g-ʌ-d̪uʌð-iṯ-ú ej um:iə ðamala éðoŋ = ðoŋ
1SG.SM-CLg-MAIN-send-APPL-PFV every CLg.boy CLð.camel CLð.own
'I sent every boy$_i$ his$_i$ camel.' / 'I sent every boy$_i$ to his$_i$ camel.'

The same pattern is found with benefactives and causatives. These facts can be most straightforwardly accounted for by a binding principle based on linear order as, e.g., proposed by for certain pronominals in Malayalam, Korean, Balinese, Japanese, and other languages (Bresnan, 1995, Arka and Wechsler, 1996, Bresnan, 2001) :

(19) A non-pronominal cannot bind a pronominal that precedes it.

In sum, HPSG provides the appropriate assumptions and representational tools to account for so-called symmetrical languages: this requires a simple modification from totally ordered to partially ordered argument structure inventories. To the degree that there are asymmetries in this domain of the grammar, these can be made to follow from independent considerations concerning linear order constraints, rather than from hierarchical structures encoding structural relations, grammatical relations or semantic roles. As a consequence, HPSG provides a perspicuous account of cross-linguistic variation without positing the sorts of principles of grammar design encoded in assumptions (1i–iii) that demand modification when encountering symmetrical languages. Symmetrical and asymmetrical organization are equally available strategies in the languages of the world and HPSG possesses the appropriate toolkit to account for either, or variations on them, when they arise.

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