

## Chapter 27

# The Matrix: Merge and the typology of syntactic categories

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In recent works (Moro 2000; 2009; Chomsky 2013; 2017; Chomsky et al. to appear; Rizzi 2015; 2016 a new type of phrasal structure has been assumed resulting from Merging two XPs where neither XP projects: the unlabelled [XP YP]. This structure stands out as an exception with respect to the typical  $X^0$ s and XPs. I will show that by considering some basic properties of Merge in an abstract combinatorial framework the stipulative character of this category is absorbed along with some potential redundancies of UG.

### 1 The $X^0$ vs. XP distinction and the lexicon

A basic opposition is manifested in syntax between  $X^0$ s and XPs. A traditional way of distinguishing between these two categories is to refer to the lexicon: an  $X^0$  directly comes from the lexicon, whereas an XP does not. In fact, this opposition can also be captured by referring to Merge by reasoning as follows.

### 2 The Matrix or beyond the $X^0$ – XP taxonomy

An  $X^0$  cannot be targeted by IM whereas an XP can; call this property “atomicity”. Interestingly, this not the only way to cast  $X^0$  and XPs into two disjoint classes by referring to Merge. An  $X^0$  cannot appear as a specifier whereas an XP can. Since a specifier is an XP which is Merged to another XP without projecting, one can say that an XP is an optional projector whereas an  $X^0$  is not; call this property “incapsulation”.<sup>1</sup>

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<sup>1</sup> This operation can in principle be reiterated generating “multiple specifiers” or one specifier and multiple adjuncts; I will maintain Kayne’s (1994) LCA-based principle according to which



- (1) A syntactic entity S is:
- a. atomic ([+a]) iff no parts of it can be targeted by IM.
  - b. incapsulable ([+i]) iff it can be merged to an XP without projecting.

Let us now construe a combinatorial square matrix based on these two independent properties displaying both positive and negative polarities and start by representing the two opposite and already recognized entities, namely an  $X^0$  as [+a, -i] and an XP as [-a, +i]:<sup>2</sup>

	+i	-i
(2)	+a	$X^0$
	-a	XP

This matrix raises a new question, namely whether there exist any [+a, +i] and [-a, -i] syntactic entities, i.e. homopolar syntactic entities, or whether there exist only the heteropolar ones. I will show that the answer is affirmative and this matrix solves the problem raised by unlabeled [XP YP] structures. Let us first consider the case of a syntactic entity with all negative polarity features.

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there can be only one element merged with a phrase to preserve the possibility of linearization. This is only partially true since there could be multiple subjects provided that only one is spelled-out at PF. The existence of these configurations is provided by inverse copular sentences in Italian. In this case, the preverbal phonologically overt DP is mutually c-commanding *pro* without violating the LCA since *pro* is not visible to linearization. Clear support for this analysis comes from cases where the preverbal subject is singular and the postverbal one plural: in this case, the copula anomalously agrees with the postverbal DP showing that there must be a *pro* (in fact a “null predicate”) mediating the agreement relation as in *la causa sono Pietro e Giovanni* (the cause-sing.fem. are Peter and John). The intervening subject is *pro* as proposed in Moro (1997) as in *la causa pro sono io* (the cause pro am I; “the cause is me”) or just *sono io* (am I; “it’s me”). Indeed, if more than one adjunct/subject is generated: all but one must move, as a consequence of the principle of Dynamic Antisymmetry.

<sup>2</sup> Matrixes are typical structuralist tools that have their origin in phonological models. In syntax, they have been used less massively; two major examples are Chomsky’s (1970) and Jackendoff (1977) – both incorrectly assuming that noun phrases cannot be predicates – and Muysken & van Riemsdijk 1986 relying on features pertaining to X-bar levels. In fact, perhaps the first use of derivative categories in linguistics can be traced to at least the Hellenistic models of grammar, witness the term “participium” (lit: that takes part) related to a verbal form which displays adjectival morphology.

## 2.1 Bare Small Clauses

A natural candidate to occupy the [-a, -i] slot is the so-called “Bare Small Clause” (BSC), prototypically represented by the complement of the copula. Two separate issues must be addressed here: a preliminary one is whether there is any empirical reason to assume that such non-atomic constituents exist; the other is whether there is any empirical reason to exclude them from the specifier position. In fact, they have both already been answered positively. I will just sketchily remind here the data upon which the answer is built.

Originally, the complement of the copula was considered to be the same as the complement of *believe*-type verbs and labelled “Small Clause” (SC): namely, a non-inflected predicative structure (see Williams 1978 and Stowell 1978 for the first proposals and Graffi 2001 for a critical survey). It has been later proposed that these two types of complements have two distinct structures (see Moro 1997 for the original proposal; and Moro 2017a,b for a synthetic update): the complement of *believe*-type verbs is a phrase headed by a predicational head – whose precise categorical nature is still under discussion – whereas the complement of the copula is an unlabeled phrase resulting from the direct merge of two phrases. The minimality of the latter structure is what justifies the term “bare”; accordingly, these phrases are represented as [XP YP] merged without any intervening head.<sup>3</sup> The specificity of this construction is not the merging of two phrases but rather the fact that *neither* phrase project, unlike the case of specifiers that yield [<sub>α</sub> XP YP] where the label *α* coincides with either phrase and the specifier is the phrase which does not project.<sup>4</sup>

The empirical reasons supporting the distinction between SC and BSC are based on several distinct domains. For the sake of simplicity, three distinct types of domains can be reminded here and exemplified in (3): the distribution of predicative markers (3a)-b;<sup>5</sup> intervening effects on cliticization, more specifically

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<sup>3</sup> This analysis revives Williams’s (1980) original proposal for the analysis of Serbo-Croatians (SCs) which was abandoned partially because of the influential proposal by Chomsky’s (1986) to uniform clause structures to the XP format, normalizing all phrases to endocentric structures.

<sup>4</sup> Notice that in this analysis of predicative structures both the subject and the predicated are encapsulated; this independent fact shows that encapsulation is more general than “specifierhood” which is inherently asymmetrical.

<sup>5</sup> The presence of a predicative marker in the complement of *believe*-type verbs was taken by Moro (1988) as the spell-out of an abstract predicative head (Pred<sup>0</sup>); its absence in copular constructions, instead, led to hypothesis that the clausal constituent was better analyzed as an AgrP and – correspondingly – the copula as the expression of tense (and aspect) features (T<sup>0</sup>) yielding a first version of the so-called “Split-Infl” hypothesis. This analysis preceded and

violations of Rizzi's (1990) Relativized Minimality (3c)-d;<sup>6</sup> instability, i.e. the necessity of movement out of the embedded clausal structure both in English (3e)-g and in *pro*-drop languages (3g):<sup>7</sup>

- (3) a. Mary considers [John (as) the culprit] (cf. also *John is considered t (as) the culprit*)  
b. John is [ *t* (\*as) the culprit]  
c. Italian  
\* lo ritengo [ Maria H<sup>0</sup> *t* ]  
so-CL believe Maria  
d. Italian  
Maria lo è [ *t t* ]  
e. Mary considers [ John stupid ]  
f. \* is [ John stupid ]  
g. Italian  
\* è [ Gianni stupido ]  
is Gianni stupid

All these facts converge toward the analysis according to which the complement of the copula consist of merging two phrases without the intervention of a head. This analysis has proved to be consistent across languages; a strong support to the existence of BSCs along with SCs comes from Pereltsvaig's analysis

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was empirically distinct from the influential version proposed by Pollock (1989) and was later partially abandoned in favor of the unheaded BSC hypothesis, while maintaining the idea that IPs were in fact to be analyzed as TPs.

<sup>6</sup> I have simplified the representation in (3d): for locality reasons, a BSC can never be completely evacuated (see Moro (1993) elaborating on Rizzi's (1990) notion of head-government.. The clitic is rather sub-extracted from a DP as an N<sup>0</sup>. The same D<sup>0</sup>/N<sup>0</sup> distinction holds for *wh*-elements where *which* corresponds to D<sup>0</sup> while *what* to N<sup>0</sup>, witness cases like *what a party!* where the *wh*-element co-occurs with an overt D<sup>0</sup>; this also explains the possibility to extract *what* but not *which* in existential sentences (see Moro 1997 revising Heim's 1987 semantic account of this contrast and the locality conditions on extraction; see also Moro 1993 for locality issues within a Minimalist framework).

<sup>7</sup> Notice that the *pro*-drop parameter is totally irrelevant here: movement is required in Italian on a par with in English. No "expletive" can rescue the structure where neither phrase moves, not even *ci* (there), reinforcing the hypothesis that movement is required to solve the instability of the lower BSC rather than satisfy some specific condition of the subject position; for the impact of this phenomenon on discharging the the Extended Projection Principle see Moro (1997; 2000) and, in particular, Moro (2009) for a detailed discussion involving the role of Focus<sup>0</sup> in post-verbal positions.

of Russian (Pereltsvaig 2007). Moreover, it has also been proposed that BSCs also occur in nominal domains, as complements of  $P^0$  heads playing the same role as the copula in that they provide a landing site for either the subject or the predicative phrase (Moro 2000; see also Kayne 1994, den Dikken 1997, Zamparelli 2000). Simple examples are pairs like *these types of books* vs. *books of this type* which are generated by the same underlying structure containing a BSC, namely [ of [<sub>BSC</sub> [books] [this type]]], by raising either the subject [books] or the predicative nominal [this type] to the specifier of  $P^0$  (cf. *books are of these types*). We can now turn to the second issue, namely as to why BSCs cannot be specifiers.

One of the special properties of BSCs – witness examples like (3f)-g – is that they force movement of either XP: if the two XPs constituting the BSC are both noun phrases then either movement is possible, yielding a canonical vs. inverse copular sentence depending on whether the subject or the predicate raises (and similarly, *mutatis mutandis*, in nominal constructions); if the predicate of the copular sentence is not a noun phrase – say an adjectival phrase – then the only viable rescue strategy is for the subject to raise, because of the morphological restrictions imposed on the landing site (arguably related to Case assignment). The reason of the instability of this structure is inherently related to the symmetrical nature of this configuration; there are two alternative explanations, one based on the LCA (Moro 2000) – movement is necessary to allow linearization of two mutually c-commanding phrases – the other on labeling algorithm (Moro 2009) – movement is necessary to provide a label to the BSC (see also Moro 2000; 2009; Chomsky 2013; 2017; Chomsky et al. to appear; Rizzi 2015; 2016 for further support to this explanation and in general for the principle of Dynamic Antisymmetry). It could well be that both explanations are valid and that this phenomenon reveals a twofold nature of instability depending on the test adopted. Duality is not *per se* to be avoided in empirical science if it is grounded and impinges on separate empirical reasons.

However, for what matters here, even if only one explanation will turn out to be true, still the instability – hence, the necessity of movement out of a BSC – remains as an undisputed fact. And it is this very fact that offers a straightforward explanation for the second issue addressed in this section, namely as to why BSCs cannot be specifiers. An obvious case study is the impossibility for BSC to be clausal subjects, i. e. specifiers of TP. The crucial fact is that movement is banned from within this position unless some specific conditions are realized which do not apply here (for the locality conditions on the subject position see in particular the discussion in Rizzi 2015, Stepanov 2007 and references cited there). All in all, the impossibility for a BSC to occur as a subject follows for principle reasons

without ad hoc stipulations: on the one hand its instability requires movement; on the other, movement is impossible for locality conditions.<sup>8</sup>

Eventually, the homopolar negative slot [-a, -i] generated by the matrix in (2) can then be filled in by BSCs:

	+i	-i
(4)	+a	X <sup>0</sup>
	-a	XP BSC

The matrix, in fact, completely eliminates the stipulative character of BSCs: these acentric phrases are not exceptions as they are now framed in the same two property based grid generating the other two categories, namely words and endocentric phrases. The exception would now rather be if they did *not* exist.

## 2.2 Expletives

There is a residual empty slot in the matrix in (4), namely the homopolar positive syntactic entity: [+a, +i]. Is there a reason for assuming that there exist atomic entities that can occur as the specifiers of a phrase, that is that can be encapsulated? I would like to suggest that this category exists and coincides with expletives.<sup>9</sup> In a sense, this assumption is trivially proved. Elements like *there* in English existential sentences, for example, are clearly atomic but they cannot further project when merged with a phrase - in fact, they prototypically end up occupying the position canonically reserved to clausal subjects - hence [+i]. Nevertheless, they do qualify as exceptions since atomic entities, i.e. X<sup>0</sup>s, do project and they cannot occupy the subject position: expletive appear like “inert heads”. One possibility

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<sup>8</sup> Interestingly notice the following contrast:

- (i) a. \* [John the culprit] is strange
- b. [for John to be the culprit] is strange

This shows that what prohibits for a clausal structure to be clausal subject is not related to the finiteness of tense and aspects features. As for the possibility of a local movement to a focal position to solve instability see Moro (2009) Notice also that being BSC [-i] it must project when merged with an XP: this is consistent and in fact it derives the solution to the instability of these constituents as predicted by the principle of Dynamic Antisymmetry (see Moro 2000; 2009; Chomsky 2013; 2017; Chomsky et al. to appear; Rizzi 2015; 2016).

<sup>9</sup> I refer to “expletives” in general but a more fine-grained terminology would distinguish between subject-expletives as in *it was clear that John left* and predicative-expletives as in *it's that John left*, just to remain to pro-CPs, along the lines of Moro (1997).

would of course be to assume that expletives are not real heads but rather “monolithic” phrases which exceptionally contain no parts visible to Internal Merge but this would of course be a way just to rephrase the situation. On the other hand, however, the capacity of expletives to share *some* properties with heads can indeed be independently supported, by considering more fine-grained and hidden empirical data, such as those manifested in copular constructions. Consider the following contrast taken from Moro 1997 (see also Stepanov 2007 for an analysis of the same data in (5a):<sup>10</sup>

- (5) a. which wall do you think there was [a picture of *t*]  
 b. \* which wall do you think the cause of the riot was [a picture of *t*]

Following Moro (1988; 1997), I will assume that *there* is not a subject expletive which is inserted late in the derivation; this element is rather a pro-predicate expletive raised from a lower position or, equivalently, that existential sentences like (5b) belong to the more general class of inverse copular sentences: cf. [there was [ [a picture of the wall] *t* ]]. In (5b), instead, the phrasal predicate *the cause of the riot* is raised to the pre-verbal position. The major difference between the two sentences, then, is that the head of the predicate is embedded in (5b) (namely, *cause*) whereas it edges the TP phrase in (5a) (namely, *there*).

This distinction allows to explain this contrast by appealing to the notion of L-marking. More specifically, Moro (1997) adopted the version of L-marking as formulated in Cinque (1990) which differed from Chomsky’s (1986) original proposal: Cinque’s version is based on the selectional capacities of a head rather than its theta-marking ones. Synthetically, a phrase is an island (or a barrier to movement) unless it enters into a local relationship with a head selecting it, where by “local relationship” a minimal dominance relation is intended canonically expressed in terms of c-command. An interesting remark on L-marking highlights its persistence in Minimalist frameworks: “Though varieties of government would be ‘imperfections’, to be avoided if possible, the closer-to-primitive notion of L-marking should pass muster, hence also notions of barrier that are based on nothing more than L-marking” (Chomsky 2000, 117; for a critical review

<sup>10</sup> This contrast was also discovered with respect to Quantifier Raising:

- (i) a. there weren’t pictures of many girls  
 b. the cause of every riot wasn’t pictures of many girls

The embedded quantifier *many* can have scope over negation, hence be extracted from the subject DP at LF, only in a *there*-sentence (ia). Notice that the example in (ia) falsifies Williams’s (1984) analysis of *there* as a scope marker: for a full discussion, see Moro (1997: Ch. 2).

of the notion of L-marking and the empirical and historical reasons behind it see Roberts 1988).

All in all, the impossibility to extract from within the post-verbal subject in (5b) is immediately explained by the fact that it is not L-marked: the element selecting it is the predicative head *cause* and it fails to c-command it; the only other head c-commanding the subject is the copula: although it qualifies in terms of local configuration, it does not select the subject: thus the subject is not L-marked and extraction from it yields an ungrammatical sentence. This parallels the case of a preverbal subject of an embedded sentence: it is in a proper local configuration with a complementizer c-commanding it but it is not selected by it (see Rizzi 2000, Rizzi 2015; see also again Stepanov 2007 for critical considerations on extractions from the subject position). In (5a), instead, the head *there* (locally) c-commands the lower subject and it selects it in its capacity as a pro-predicate: thus, the subject is L-marked and extraction is viable. The special head-like relation between the expletive *there* in subject position and the copula is also manifested in the fact that the copula anomalously shows rightward agreement, reasonably a sign that the number features of the subject have been transmitted by the pro-predicative element selecting it.<sup>11</sup>

- (6) a. there were many pictures of the wall  
b. the cause of the riot was/\*were many pictures of the wall

Similar considerations concerning *there* would hold for pre-verbal *it* in quasi-copular sentences such as *it seems that Mary left* as well as in inverse copular sentences with clausal subjects like *it's that Mary left*, whose common structure is: [ it V<sup>0</sup> [ [that Mary left] t ]. There are also other occurrences of *there* with other verbs than the copula which would lead to the same conclusion, namely unaccusative constructions but illustrating them here would take us too far (see

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<sup>11</sup> That there are cases where the nominal head of a predicate *must* agree with its subject is independently attested in cases like:

- (i) I consider John and Peter my best friend\*(s)

However, agreement is by no means obligatory in all cases. In fact, there can be a complete mismatch in gender and number as in:

- (ii) considero i libri la mia passione  
consider-1SG the-M.PL books-M.PL the-F.SG my-F.SG passion-F.SG

See Moro (1988; 1997; 2017a) for further considerations.



Moro 1997 and the crucial extensions suggested in the comprehensive theory of argument structure proposed in Hale & Keyser 2002).

Crucially, for what matters here, there is a further piece of evidence in favor of the fact that expletives have a twofold nature. In the previous examples, I have provided evidence that they share the same selectional properties as *heads*; it can be also proved that they do behave like *phrases* by reasoning as follows. Expletives are only merged with other phrases; as [+i] elements they cannot project, thus the resulting phrase can either be a full endocentric phrase (where the other element projects) as in [<sub>TP</sub> Expl TP ] or it can be a BSC (where neither phrase projects) as in the [<sub>BSC</sub> DP Expl ] generating (5a) where neither phrase projects. In the latter case, either phrase must be further moved as predicted by Dynamic Antisymmetry:<sup>12</sup>

The very existence of atomic and incapsulated syntactic categories (expletives) is ultimately well-grounded empirically and this allows us to fill in the last available slot in the two property based grid:<sup>13</sup>

<sup>12</sup> For the reasons why the expletive raises and the impact it has on semantic structure see Moro (1997: Ch.3), Moro (2000; 2009); Chomsky (2013; 2017); Chomsky et al. (to appear); Rizzi (2015; 2016) if the expletive did not have phrasal properties and they were just like heads, it would be hard to explain why the structure is unstable and it requires movement. All in all, expletives appear to share some properties with both  $X^0$  and XPs.

<sup>13</sup> Notice that the BSC analysis originally proposed for existential sentences, quasi-copular sentences, and unaccusative constructions has been extended to cover previously unrelated constructions. In particular, the same analysis has been proposed to include wh-phrases to explain split interrogatives, including the classic “*was-für* split phenomena” and its equivalent in Romance Languages (see Moro 2000 and Ott 2012 for a further and original extensions of this proposal). In Italian, for example, we get the following case study where the particle *di* (of) plays the same role as a nominal copula in *questi tipi di libri* (these types of books) forcing movement of the wh-element *cosa* (what) to the specifier position of the proper CP-slot:

- (i) *cosa legge* [ *t di* [<sub>BSC</sub> *libri t* ] ]?  
 what reads-3SG of books  
 ‘What books does s/he read?’

For what matters here, examples like (i) show that the twofold nature of elements like *there* is not isolated to canonical expletives: it is rather unexpectedly shared by wh-elements like *cosa* (what) which constitute an unstable structure with another full phrase, revealing their phrasal nature, but do not contain any part accessible to Internal Merge, i.e. they behave like  $X^0$ . We should perhaps speak of “generalized expletives” to include clausal and non-clausal ones.

	+i	-i
(7)	+a Expl X <sup>0</sup>	
	-a XP BSC	

### 3 On evaluating the matrix: Suggestions for the future agenda

The fourfold taxonomy generated by the matrix absorbs the exceptionality of BSC and Expletives framing them along X<sup>0</sup> and XP in a natural way within the same grid generated by two syntactic properties formulated by referring to Merge.

In principle, this may not be the only welcome result: the matrix could also be exploited to capture further empirical generalizations. For example, it reveals natural classes – i.e. agreement is possible only with a [+i] category – or it allows to identify grammatical functions in a more comprehensive way – i.e. predicative structures coincide with [-a,-i] category (see Moro 2000; 2004 for further discussion) or simplifications – i.e. two homopolar entities (namely, expletives and BSCs) cannot be merged. Whether or not this matrix will be theoretically useful for formulating new questions is left for future research to answer.

### Abbreviations

1 = first person, 3 = third person, BSC = bare small clause, CL = clitic, F = feminine, IM = Internal Merge, LCA = Linear Correspondence Axiom, LF = Logical Form, M = masculine, PF = Phonetic Form, PL = plural, SC = small clause, SG = singular, UG = Universal Grammar.

### Acknowledgements

My special thanks go to Robert Frank, Raffaella Zanuttini, Giorgio Graffi, Cristiano Chesi, Andrew Nevins and Alessandra Tomaselli for their illuminating remarks and two anonymous reviewers: the errors remain all mine. I wish I wrote this paper in Italian for if Ian translated it for me it would have become much better.

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