# Labeling and depictive secondary predicates

Valentina Bianchi

UNIVERSITY OF SIENA

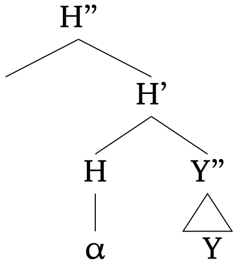
**Abstract**

*Symmetric phrase structures pose a problem for the algorithm labeling syntactic nodes on the basis of minimal distance (Chomsky 2013, Rizzi 2016). This paper discusses one case of symmetry, namely adjunction configurations involving modifiers or stacked predicates. I propose that the mother node inherits the same (macro-)categorial feature from both the adjunct and its host, and the resulting configuration is interpreted via generalized conjunction. This proposal, coupled with a decomposition of event structure à la Ramchand (2008), allows for a simple analysis of depictive secondary predicates.*

## 1 Introduction

The minimalist approach to phrase structure initiated by Chomsky (1995: 241-249) has rejected the traditional X-bar projection schema of the Principles and Parameters framework, according to which every terminal symbol α is labeled by a syntactic category H, and the dominating nodes inherit that syntactic category, augmented with bars to indicate the projection levels, as in (1):

(1)

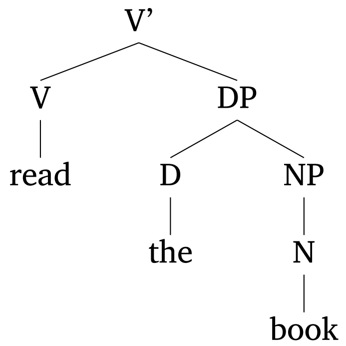



Chomsky argues that the bar diacritics violate the Inclusiveness Condition, since they are not part of the information associated with the lexical item; Inclusiveness therefore requires that the projections of a head inherit the label of that head in identical form.

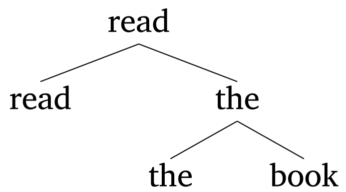
In addition, the category labels (V, N, A, P, T, C etc.) that dominate lexical items constitute a departure from minimal design in that they require a partial projection of the information contained in those lexical items. Therefore, minimal design implies that non-terminal nodes are directly labeled by the lexical items themselves.

Combining these two ideas, the phrase structure of a complex expression like *read the book* would be as in (3), instead of the more familiar (2):

(2)




(3)




According to Chomsky, even the phrase structure in (3) is non-minimal in that it encodes linear order of the merged syntactic objects; but linear ordering should be though of as a requirement imposed at the interface with the Sensori-Motor systems, and not as a requirement constraining the syntactic computation (*contra* Kayne (1994)). Dropping linear order, Merge can be reduced to set formation, and (3) is further reduced to (4):[1]

(4) {read, {read, {the, {the, book}}}}

Pursuing further the minimalist scrutiny of phrase structure, Chomsky (2013) addresses two more issues. First, whenever two labeled syntactic objects are merged together (by External Merge or Internal Merge/Move), it is necessary to univocally determine which one of the two will trasmit its label to the mother node: in other terms, it is necessary to devise a *labeling algorithm* (LA). In principle, LA should require no further information apart from that which is locally available on the labels of the two merged nodes.

[1]Following common practice, we will often retain the more familiar tree notation for convenience.

Second, the deeper question arises of why labels are needed at all, in view of the strong minimalist thesis whereby grammar is an optimal solution to the interface requirements posed by the external systems. The answer to this second question has an impact on the solution of the first issue as well. One possible view is that a node must be labeled in order to be visible for the subsequent syntactic computation: that is, labels are required by the working of narrow syntax itself (see Cecchetto & Donati 2015: 156–157 for discussion). This implies that all non-terminal nodes must be labeled *as soon as* they are formed by an application of External or Internal Merge. An alternative view is that labels are required at the interfaces, in order for syntactic objects to be legible to the external systems. This has different implications for the labeling algorithm: labeling can be delayed until the phase level, when the syntactic object is transferred to the external systems.

In this paper I discuss this second view of labeling, focusing on Chomsky's (2013) proposal, further developed and modified in Rizzi (2016) (section 2). I then introduce Rizzi's hypothesis that category labels are required at the interface with semantics (section 3), and I consider from this perspective symmetric adjunction configurations, suggesting that they are interpreted via generalized conjunction (section 4). In section 5 I discuss depictive predicates, and I show that the present approach allows for a maximally simple analysis. Finally, in section 6 I offer some concluding remarks.

## 2 Labeling and symmetric configurations

Chomsky (2013, 42-48) argues that the simplest conception of Merge is that it takes two syntactic objects α and β and creates the set {α, β}, with no projection – i.e. no label for the set provided by the Merge operation itself. Since Merge leaves the newly formed set unlabeled, a Labeling Algorithm (LA) must apply. From a minimalist perspective, LA simply consists in minimal search: that is, the set inherits the label of the closest element.

Consider Merge of a head H with a non-head (dubbed XP for convenience), yielding the set {H, XP}. Here XP stands for a set properly containing another head X, hence, more precisely, we have:

(5) {H, {X, ... }}

Since H is a member of the outermost set, whereas X is not, H is clearly closer than X to the outermost set and labels it. This corresponds to the idea that when a head selects a phrase, it is the head that projects (cf. (3) above). Head-complement relations are thus licensed, provided that the complement is complex (minimally containing an unlabeled, a-categorial root and a labeling category); if the complement is not complex, it is forced to move.

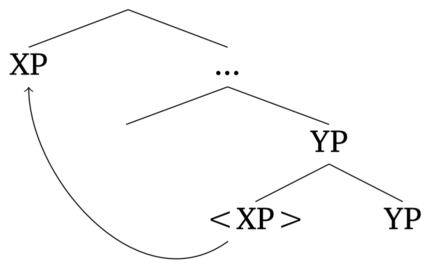
When Merge combines two non-heads XP and YP, instead, a labeling problem arises:

(6) { { X,...} {Y,...}}

the head of neither constituent is closer to the outermost set than the other: hence, LA cannot determine a unique label for the set {XP, YP}. It follows that any configuration in which two non-heads are merged is problematic for the Labeling Algorithm. Chomsky discusses two possible solutions.

The first possibility is that in {XP, YP}, one of the two elements moves away, say XP. (Note that in Chomsky's view labeling is only required at the phase level.) Move/Internal Merge creates another occurrence of XP which is not contained in the original {XP, YP} set. Assuming that a syntactic object $\alpha$ is a term of $\beta$ iff *all* occurrences of $\alpha$ are contained in $\beta$, it follows that after movement, XP is no longer a term of {XP, YP}, and its single occurrence becomes invisible to LA. Thus, the unmoved YP univocally transmits its label to the mother set:

(7)




This view takes up Moro's 2000 proposal that movement is a "symmetry-breaking" device, eliminating an illicit symmetric configuration.

Chomsky suggests that this solution of the labeling paradox via movement of one of the two phrasal sisters accounts for the so called Extended Projection Principle, i.e. the fact that an External Argument merged with the phrase headed by v must move to a higher position. Consider the configuration in (8):

(8) [T $[_{\beta}$ (EA) $[_{\delta}$ v* [ V IA ]]] (adapted from Chomsky 2013, (17))

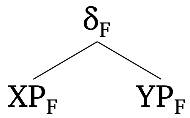
Here the External Argument (EA), a non-head, is merged with the projection $\delta$ of v*, which is also a non-head: therefore, the mother set $\beta$ cannot be labeled. The solution is to move away the External Argument and attach it to the projection headed by T: In this way, $\beta$ can inherit the label of δ (that is, v*). (Attaching the EA to the projection of T creates another problematic configuration, to be discussed below.)

A second configuration where solution (7) applies is in case of Internal Merge of a wh-phrase with the constituent labeled by a declarative Complementizer:

(9) *They thought [$_{\alpha}$ [in which Texas city] [$_{\beta}$ C [ JFK was assassinated]]]?
(Chomsky 2013, (21))

Here, again, the wh-phrase merged with β creates a set α which cannot be univocally labeled. For this reason, Chomsky argues, the wh-phrase is forced to move away, so that the mother α can be labeled by C. In this way, the requirement of unique and deterministic labeling forces the successive-cyclic movement step, which is notoriously problematic from the perspective of feature-driven movement.

In (8)-(9), the moved phrase must find a final landing site. Hence, it is necessary to devise an alternative solution to the labeling problem that can license a phrase attached to another phrase – the “halting problem” for successive cyclic movement, in the terms of Rizzi (2010). Chomsky proposes that an {XP,YP} configuration can be licensed when the two phrasal sisters share a prominent feature: the latter can be transmitted as a label to the mother node, as schematically represented in (10).

(10)



Consider for instance the configuration created by Internal Merge of a moved wh-phrase with a root phrase headed by the interrogative Complementizer, $C_Q$:

(11) [$_{\delta\text{-}Q}$ [in which Texas city]$_Q$ [$_{\gamma\text{-}Q}$ $C_Q$-did [you think [$_{\beta}$ ~~in which Texas city~~ [$_{\alpha}$ C [ JFK was assassinated ~~in which Texas city~~ ]]]]]

While, as discussed around (9), the problem of labeling β is solved by moving away the wh-phrase, the same problem resurfaces at the next landing site of the wh-phrase, as sister to phrase γ. However, γ is labeled by the interrogative Complementizer, carrying the feature Q, and the very same feature Q is shared by the wh-phrase: thus, Q can be transmitted from both daughters to the mother node δ as a label. The same solution also applies in case of local movement of a wh-phrase attaching to an embedded clause headed by the interrogative $C_Q$:

(12) They wondered [$_{\alpha\text{-}Q}$ [in which Texas city]$_Q$ [$_{\beta\text{-}Q}$ $C_Q$ [ JFK was assassinated]]] (adapted from Chomsky 2013, (22))

Another configuration in which (10) applies is the landing site of the subject as a sister to the phrase headed by T:

(13) C [$_{\alpha}$ NP$_{\varphi}$ TP$_{\varphi}$ ]] (Chomsky 2013, (16))

Chomsky proposes that TP and the subject NP share prominent features, namely the agreeing φ-features, which can be transmitted to the mother node α as a label.

Options (7) and (10) are also adopted by Rizzi (2016), who redefines in more explicit terms the notion of "closeness" embodied in Chomsky's Labeling Algorithm:

(14) Labeling by the closest head: α created by merge receives the label of head H1 such that:

- I. α contains H1, and
- II. there is no other head H2 such that
  - i. α contains H2, and
  - ii. H2 c-commands H1. (Rizzi 2016, (3))

In addition to movement of a wh-phrase away from an intermediate landing site, as in (9) above, Rizzi also derives from the labeling algorithm the so called "freezing" effect, namely the fact that a phrase sharing a feature with its sister projection is frozen in place and cannot move away, as shown in (15b):

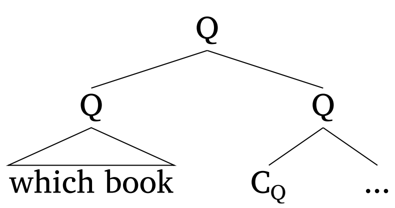
(15) a. John wonders [α = Q [which$_Q$ book]$_Q$ [Q [Bill read ~~which$_Q$ book~~]]]
b. *[β [which$_Q$ book] [Q [John wonders [α = Q ~~which$_Q$ book~~ [Q [Bill read ~~which$_Q$ book~~]]]]]] (Rizzi 2016, (23b-c))

The freezing effect is derived from the following Maximality principle:

(16) Maximality: Only maximal objects with a given label can be moved. (Rizzi 2016, (24))

In (15b), the intermediate clausal node α inherits the label Q from both the wh-phrase and the phrase headed by C$_Q$, as schematically represented in (17) below. Hence, the wh-phrase no longer qualifies locally as the maximal object with the label Q (since it is dominated by a node with the same label), and by principle (16), it cannot be moved.

(17)



In sum, the Labeling Algorithm can explain the special status of configurations involving two phrasal sisters, distinguishing those in which one phrase is forced to move (e.g. (9)) from those in which both phrases can remain *in situ* via feature sharing (e.g. (11)-(12)), and in fact *must* do so (cf. (16b)).

One immediate consequence of this approach is that it disallows free adjunction. We will consider some consequences of this constraint below.

# 3 Labeling and the interface with semantics

Both Chomsky and Rizzi assume that every node in a syntactic tree must be labeled at the interfaces. This requirement is explicitly stated by Rizzi in the following way:

(18) Uniform labeling: At the interfaces, a tree must be completely labeled. (Rizzi 2016, (1))

The next question is what motivates such a requirement. Chomsky (2013, 43) proposes that labeling is forced by requirements imposed by the external systems at the interfaces with syntax. It follows that labeling applies at the phase level, before each phase is transferred to the external systems:[2]

> For a syntactic object SO to be interpreted, some information is necessary about it: what kind of object is it? Labeling is the process of providing that information. Under PSG and its offshoots, labeling is part of the process of forming a syntactic object SO. But that is no longer true when the stipulations of these systems are eliminated in the simpler Merge-based conception of UG. We assume, then, that there is a fixed labeling algorithm LA that licenses SOs so that they can be interpreted at the interfaces, operating at the phase level along with other operations.

Consider first the interface with morphology. Chomsky maintains that lexical (open class) items correspond to a-categorial stems which are selected by semi-functional heads (little n, little v etc.) that assign them a specific categorial status. For instance, the lexical stem LIE can be selected by n, yielding the noun *lie,* or by v, yielding the verb *(to)*

[2] In general, any principle can be motivated either by the working of the syntactic computation or by external interface requirements (Chomsky 2004).

*lie*. The head selecting a lexical stem can thus be seen as determining a specific syntactic category.

However, if we consider languages that are morphologically more complex than English, such as Italian or Latin, we realize that the semi-functional heads cannot carry just a categorial label, for in such languages a given syntactic category has more than one declension class. Be this as it may, the interface with morphology would only require the labeling of nodes that carry some inflectional morphology; it is far from obvious that it would require uniform labeling of all nodes, and in particular, of those nodes which dominate two phrasal sisters.

As for the interface with phonology, if we assume cyclic spellout, as in e.g. Kratzer & Selkirk (2007), the interface with phonology must be able to identify the complement of each phase head, in order for Transfer to apply[3] (see also Cheng & Downing 2016 for discussion). As for stress assignment by the Nuclear Stress Rule, if it is sensitive to levels of embedding – as proposed in Cinque (1993), Zubizarreta (1998) and subsequent work – then the only necessary information is the hierarchical relations between the nodes (expressed in terms of containment relations). Finally, as for the determination of linear order, the linearization algorithm and its relation with the labeling algorithm remains to be specified.

Rizzi (2016, 105) justifies principle (19) by specifically invoking the interface between syntax and semantics:

> More generally, uniform labeling could be a consequence of interpretive principles, which may need labels to properly interpret structure. Intuitively, this makes sense: a DP, a VP and a CP are interpreted differently, and interpretive principles may be sensitive to the "canonical structural realizations" of semantic types.

Under this view, category labels are a way of making the syntactic structure legible to type-driven compositional rules. Note that if we want to pursue this idea in a conceptually consistent way, we are led to assume that every syntactic category is mapped into one, and only one, semantic type (as in Montague Grammar). This has non-trivial consequences: for instance, a declarative complement CP and a relative CP must have different labels, since their denotations are of different semantic types (roughly, a proposition vs. a one-place predicate). This difference can be implemented in a featurally rich system (as in Rizzi 1997; 2010), where a relative CP could be endowed with a distinguished [rel] feature.

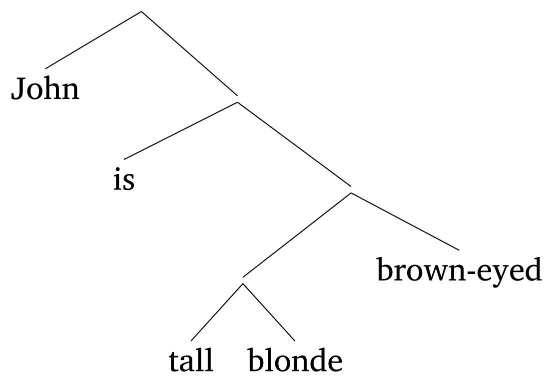
[3]According to Bošković (2016: 59–60) this can be obtained if labeling of head-complement merger, as in (5), takes place immediately as part of the syntactic computation, rather than being delayed.

One way of cashing out Rizzi's insight is to assume that at the interface, semantic composition is type-driven function application (in the sense of Klein & Sag 1982), and the semantic types are directly "read off" the syntactic labels. For instance, in a head-complement relations, the D category denotes a function that requires in input a predicative category NP (extensional type ⟨e,t⟩) and returns a denoting category DP (extensional type e); an intransitive V denotes a function (extensional type ⟨e, ⟨v,t⟩⟩, with v the type of eventualities) that selects for a denoting category DP and returns a property of eventualities (type ⟨v,t⟩) at VP level. This function-application mechanism can be extended to the hierarchy of functional heads (see Heycock & Zamparelli 2005 on the nominal domain, Ramchand & Svenonius 2014 on the clausal domain).

# 4 Unstructured coordination/stacking

We noted above that the Chomsky-Rizzi Labeling Algorithm disallows free adjunction of a phrase to another phrase. Various instances of adjunction can be reanalysed in terms of an Agree-licensed configuration between a phrase and a (possibly abstract) functional head, as in the "cartographic" approach (see Cinque & Rizzi 2010 for general discussion); yet some phenomena are hardly amenable to such a reanalysis. One problematic case is unstructured coordination in the sense of Chomsky (2013), where a number of predicative phrases are attached to one another while remaining semantically independent (i.e., each one is individually predicated of the subject), as shown by their commutativity:

(19) a. John is tall, blonde, brown-eyed,....




b. John is blonde, tall, brown-eyed.... (commutativity)

Clearly, the attachment of multiple predicates cannot be solved by movement. A feature-sharing configuration could be envisaged for (19a,b), but it would hardly generalize to other cases, like e.g. the stacking of

PPs:

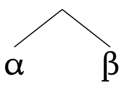
(20) John ate the spaghetti [with a fork] [in the kitchen] [at midnight]

The solution devised by Chomsky is to analyse unstructured coordination in terms of Pair-Merge – a special instance of Merge creating an ordered pair instead of a set. It is then stipulated that the two objects in the ordered pair are interpreted "on separate planes" and do not interact with each other. This solution, besides being stipulative, raises the problem of how a pair-Merged coordinated modifier can interact with the "argumental" plane, for instance in case of quantifier binding:

(21) Every $\text{girl}_1$ ate the spaghetti [with a fork] [at midnight] [in $\text{her}_1$ kitchen]

If we look at this configuration from the perspective of type-driven interpretation, the diagnosis is simple: when two predicative categories are merged together, the result is another predicative category of the same semantic type. This result is obtained straighforwardly by generalized conjunction à la Partee & Rooth (1983), along the following lines:

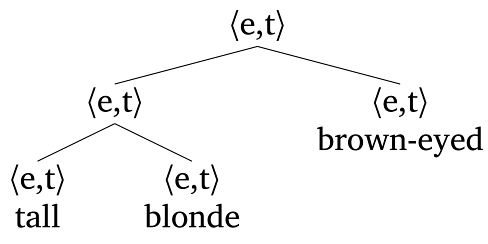
(22) In the configuration:




where α and β are of the same conjoinable type ("ending in t"), the mother node is interpreted as $[\lambda x.\ [\![\alpha]\!](x)\ \&\ [\![\beta]\!](x)]$

Since each of the two daughter nodes denotes a function characterizing a set (extensional type ⟨e,t⟩) their conjunction yields a function characterizing the intersection of the two original sets. This can, in turn, be merged with another predicative category with the same denotational type, which explains free iterativity. Moreover, since intersection is commutative, the order of the conjoined elements is irrelevant:

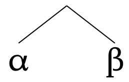
(23)




From the viewpoint of type-driven interpretation, then, the configuration is unproblematic; the question is how it should be labeled.

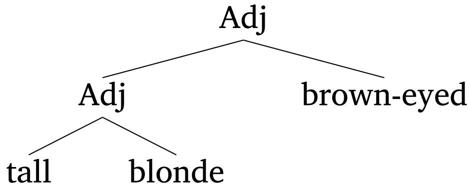
On the syntactic side, we can assume a principle of symmetric inheritance whereby when two sister nodes bear the same predicative category, the mother node inherits the same category from both daughters:

(24) Symmetric inheritance: In the configuration




where the two daughters belong in the same predicative category, the mother node is labeled by that category.

(25)




This solution, however, is not general enough: notice that it is possible to stack predicates belonging to *different syntactic categories*, e.g., adjectives and prepositional phrases:

(26) John is tall, with brown eyes...

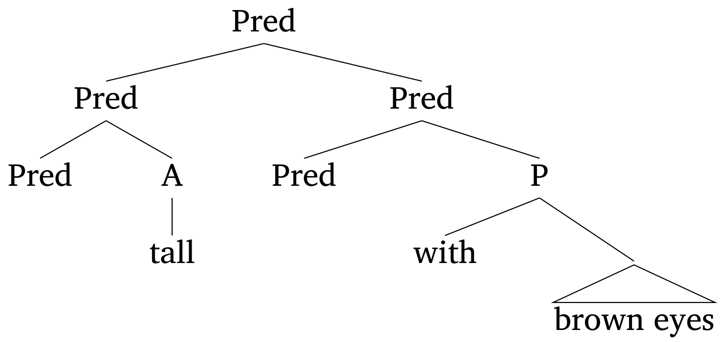
In this case, the daughter nodes do not share the same category that can be "inherited upward" by the mother node. Put differently, unstructured coordination/stacking sees different syntactic categories as being mapped into the same conjoinable semantic type and does not care for the difference.

I can see three possible ways out of this labeling dilemma.

The first option would be to assume that the mother nodes remain unlabeled, and the interpretive rule (22) applies as a default. Although this assumption works locally, it raises a problem at the level of the next phase up: under our previous assumptions, Tense requires in input a predicative category, but its sister node would be unlabeled, so the interface would not be able to map this configuration into a legal semantic composition step.

A second solution is to assume that the non-uniformity of syntactic categories in (26) is only apparent: that is, each of the conjoined predicates is "enveloped" by the same covert syntactic category, call it Pred (see Bowers 1993; Den Dikken 2006): then, by symmetric inheritance the mother nodes inherits this category from both daughters.

(27)




The last solution is to assume, in the spirit of featural Relativized Minimality (Rizzi 2010), that categorial features are grouped in classes like the following:

(28) a. Argument: D, $C_{declarative}$
b. Predicate: Adj, N, P, $C_{relative}$ ...
c. Operator: Neg, Q(uantifier),...

We can then assume that the labeling algorithm, when confronted with the Merge of two distinct categories belonging in the same class, labels the mother node with the macro-feature of the class to which both belong. In (25), the Merge of a PP with an AP would then be labeled by the Predicate macro-feature.

It is hard to find empirical evidence to distinguish among these solutions. Nevertheless, I wish to stress that the configuration exemplified in (19)-(26), merging two predicative categories, generalizes beyond modifiers stacking. In the next section I will show that depictive secondary predicates allow for a maximally simple analysis in terms of generalized conjunction of two denotations of the same semantic type. Since the main predicate and the depictive secondary predicate plausibly have different syntactic labels, this is another instance of the problematic configuration exemplified in (26).

# 5 Depictive predicates

Depictive secondary predicates constitute an interesting case study for the labeling algorithm, since they involve attachment of a phrase (the secondary predicate) to another phrase (the main predicate).

A preliminary question to be addressed concerns the attachment site of depictives. Two empirical arguments suggest a low attachment site. First, in Italian a depictive predicate can be predicated of a post-verbal subject in a broad focus sentence, as in (29):[4]

[4]The licensing of post-verbal subjects under broad focus is constrained by the re-

(29) a. E' arrivato Nižinskij vestito con un costume esotico.
is arrived Nižinskij dressed with a costume exotic
b. E' arrivato Nižinskij in costume esotico.
is arrived Nižinskij in costume exotic
*'There arrived Nijinsky wearing an exotic costume.'*

It can be shown that such post-verbal subjects (in declarative clauses) are syntactically low (see Cecchetto 2000 for evidence based on reconstruction effects). Given the standard hypothesis that predication requires c-command, we are led to conclude that in (29) the secondary predicate must be attached to a low projection.

Second, we observe obligatorily disjoint reference between a cliticized argument of the main predicate and an R-expression contained in the depictive predicate:

(30) a. *Gli$_i$ è apparso Nižinskij [travestito da Djagilev$_i$]
him.DAT is appeared Nižinskij disguised.M.SG. as Djagilev
b. *Lo$_i$ inseguiva Nižinskij [travestito da Djagilev$_i$]
him.ACC followed Nižinskij disguised.M.SG as Djagilev

Disjoint reference can be analysed as a Principle C effect if the clitic (by hypothesis licensed in an inflectional layer of the clause) c-commands the depictive.

Depictive secondary predicates have different interpretations depending on the nature of the main predicate. With change of state predicates, the state described by the depictive predicate holds in concomitance with the result state (cf. Rothstein 2000, 253-255):

(31) Nižinskij è arrivato/uscito/comparso vestito con un costume
Nižinskij is arrived/gone-out/appeared dressed with a costume
esotico.
exotic
*'Nijinksy arrived/went out/appeared wearing an exotic costume.'*

With activity verbs, instead, the state described by the depictive predicate holds throughout the process phase of the event:

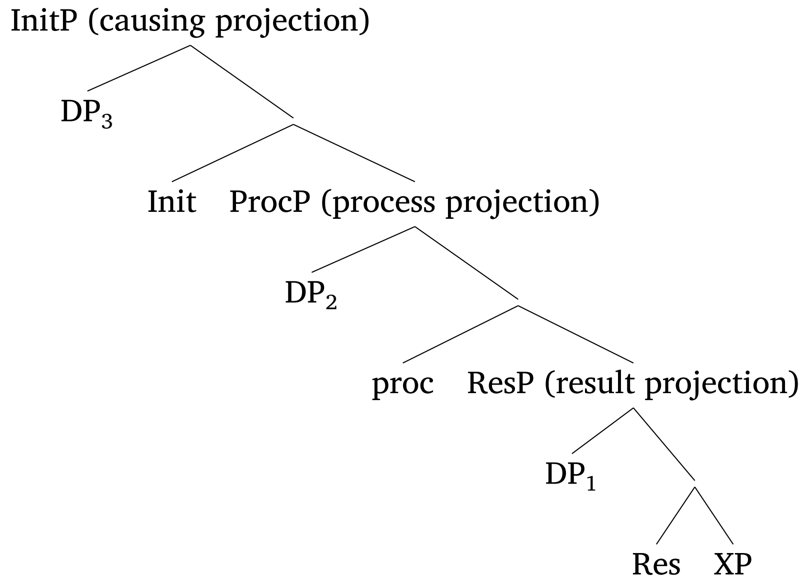
(32) Nižinskij danza/dorme/vaga vestito con un costume esotico
Nižinskij dances/sleeps/wanders dressed with a costume exotic
*'Nijinsky is dancing/sleeping/wandering wearing an exotic costume.'*

In order to capture this difference, I assume the decompositional approach to event structure proposed by Ramchand (2008). In this ap-

qurement that the sentence must introduce a temporally and spatially delimited "topic situation" (cf. Klein 2008 for discussion). This condition is satisfied in our examples.

proach, the topmost projection in the verb phrase encodes the causing eventuality (a state) and the argument related to it ($DP_3$) is the INITIATOR of the eventuality. The central projection encodes the dynamic part of the event (the process) and licenses the argument undergoing the process ($DP_2$, dubbed UNDERGOER). Finally, the lowest projection encodes the result state (if any) and licenses the argument that comes to hold the result state ($DP_1$, dubbed RESULTEE):

(33) (Ramchand 2008, 39, (1))




The basic rule of event composition[5] expresses the 'leads to' relation connecting the subevents within a complex eventuality:

(34) Event Composition Rule (Ramchand 2008, 44-45)
$e = e1 \rightarrow e2$: e consists of two subevents e1, e2, such that e1 causally implicates e2.

(35) Res = $\lambda P \lambda x \lambda e[P(e)$ & *res*'(e) & State(e) & Subject(x,e)]

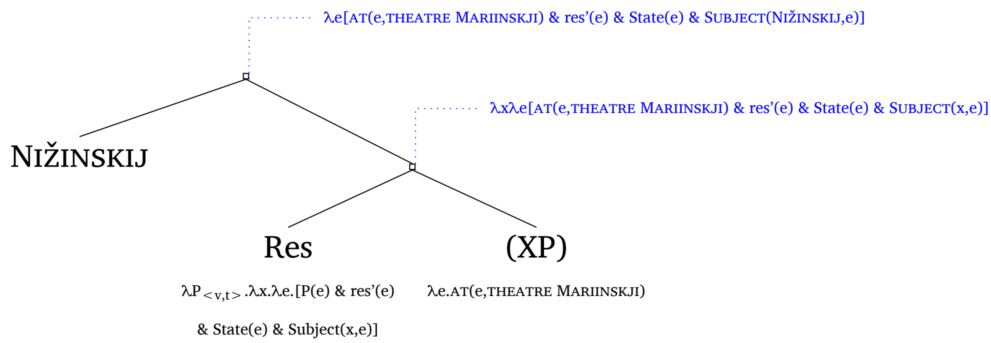
(36) Proc = $\lambda P \lambda x \lambda e \exists e_{1,} e_2[P(e_2)$ & *proc*'($e_1$) & Process($e_1$) & $e = (e_1 \rightarrow e_2)$ & Subject ($x,e_1$)

(37) Init = $\lambda P \lambda x \lambda e \exists e_{1,} e_2[P(e_2)$ & *init'*($e_1$) & State($e_1$) & $e = (e_1 \rightarrow e_2)$ & Subject ($x,e_1$)]

For a change of state verb like *arrive* in (29), we have the following structure (assuming an implicit locative as complement of the lowest head):

[5]Ramchand (2008) uses 'event' rather than 'eventuality' as a general cover term. I retain her terminology in reporting her definitions.

(38)



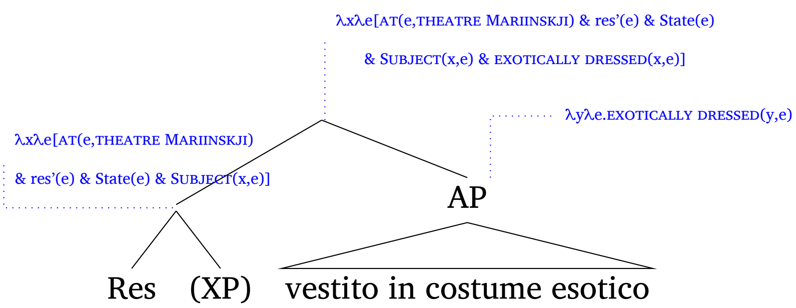

Let us assume for concreteness that the implicit Locative argument introduces the set of states of being at Theatre Marinskji. The Res head denotes a function that takes in input this set of states (type ⟨v,t⟩, where v is the type of event(ualitie)s) and introduces the valence for an Subject; this valence is then saturated by merging the resultee.

Let us consider now how a depictive predicate can be merged in such a structure. The simplest analysis for a depictive is that it denotes a relation between an individual and a stative eventuality (cf. Rothstein (2000)), of extensional type ⟨e,⟨v,t⟩⟩:

(39) $\lambda y_e.\ \lambda e_v.$EXOTICALLY-DRESSED(y,e)

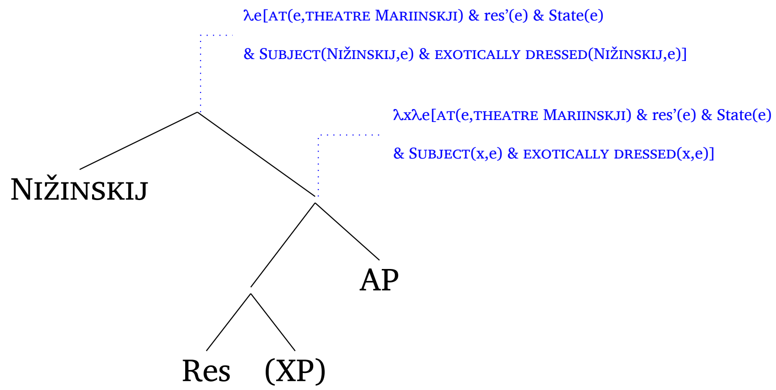
Note now that the intermediate projection of (38), with the subject role yet unsaturated, has exactly the same semantic type as the depictive predicate of (39), namely a relation between an individual and an eventuality. We can therefore assume that the depictive predicate adjoins to this node *before* the subject argument is merged, as shown in (40). The two functions, being of a conjoinable type (⟨e,⟨v,t⟩⟩), are interpreted by generalized conjunction, whereby they are incorporated in the value description of a single function (again of type ⟨e,⟨v,t⟩⟩), which is the denotation of the mother node.

(40)



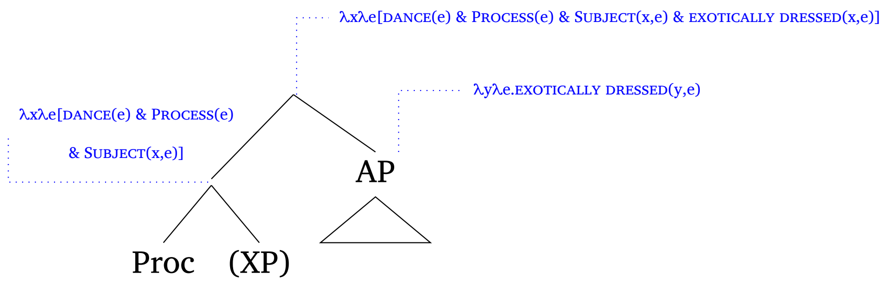

This configuration is parallel to that of unstructured coordination in (23) above: two daughter nodes bear the same conjoinable type ("ending in t"), and the configuration is interpreted at the interface via generalized conjunction. When the Resultee is merged, it simultaneously becomes the subject of the result state and of the depictive predicate:

(41)



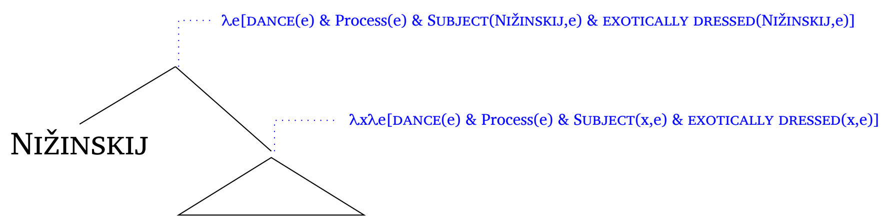

The conjunctive analysis proposed above for change of state verbs can also be adopted for depictive secondary predicates combining with an activity verb, as in (32) above. Let us assume that the relevant activity verbs, like *dance* or *perform*, do not include a Result Phrase in their event structure, and the complement of Proc is a silent cognate object; the depictive predicate adjoins to the intermediate projection of the Process head (cf. Ramchand 2008, 104):

(42)




Again, the main and the secondary predicate are interpreted as conjoined and the secondary predicate is thus simultaneous to the process phase of the event. When the Undergoer is Merged with this structure, it becomes the subject of both the main and the secondary predicate:

(43)




Concerning the agreement of depictive adjectives, notice that in (41) and (43), the head of the secondary predicate is in a minimal configuration with the DP, where "minimal configuration" is defined as in Rizzi

(2016, 106, (4)):

(44) X is in a *minimal configuration* with Y with respect to local relation R only if there is no Z such that
i. Z c-commands Y and Z does not c-command X, and
ii. Z is of the same type as X with respect to R.

Thus, the secondary predicates can agree for phi-features with the c-commanding DP.

In sum, the hypothesis that depictive predicates are interpreted via generalized conjunction can account for the relation of the depictive with different subevents in the case of change of state vs. activity verbs.

# 6 Taking stock

The Chomsky-Rizzi Labeling Algorithm has two ways of labeling the Merge of two phrases: either one of the two moves away, thus allowing its sister to label the mother node, or the two phrases share by Agree a syntactic feature that can be trasmitted by both to the mother node.

We have seen that the Merge of two predicative phrases, as in predicate stacking and depictive secondary predicates, does not fit with either of these labeling options. However, the merge of two predicates is fully interpretable via generalized conjunction, and this arguably constitutes the most simple analysis. From this perspective, the "semantic labeling" is straightforward: the two daughter nodes denote predicates of the same conjoinable semantic type, and the mother node also denotes a predicate of the same type. Given Rizzi's (2016) assumption that semantic types are conveyed by syntactic labels, we are led to expect that in these configurations the two daughters and the mother node share the same label. This led us to propose the symmetric inheritance principle (24) in order to properly label such configurations.

This solution is apparently defied by cases of stacking of distinct syntactic categories, as in (26). Note that we could in principle relax the one-to-one correspondence between syntactic categories and semantic types, and allow distinct categories to be mapped to the same semantic type. In this way, generalized conjunction could apply, but we would still have a problem on the syntactic side: the LA could not choose between the distinct and equi-distant labels of the two daughters.

One possible solution is to "top" each of the two predicates in (26) with a covert syntactic projection that would make them identically labelled. Another possibility is to assume that categorial features are grouped in classes and subordinated in as feature geometry to a "macro-feature", such as Predicate; the symmetric inheritance principle could thus select the macro-feature as the label for the mother node.

Note that the symmetric inheritance principle (24), combined with the generalized conjunction rule (22), implies that all "adjunction" configurations should involve predicative categories corresponding to conjoinable semantic types. This still leaves out apparent cases of argument adjunction, notably Quantifier Raising (but also Complex NP Shift). In this respect, more work is needed to complete the labeling approach.

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