

A quick squib on nonintersective adjectives

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1 Non-intersective adjectives

If all adjectives are of type $\langle e, t \rangle$ and are combined by the predicate modification rule given in p.65 of Heim and Kratzer (1998) (given as 1 below), they are all predicted to function “intersectively”, that is, it is predicted that $\llbracket \text{Adj N} \rrbracket(x) = 1 \leftrightarrow \llbracket \text{Adj} \rrbracket(x) = 1 \wedge \llbracket \text{N} \rrbracket(x) = 1$. This is clearly not the case for many $[\text{Adj N}]$ constructions, such as “former teacher” or “false cognate”.

(1) *Predicate modification*

If α is a branching node, $\{\beta, \gamma\}$ is the set of α 's daughters, and $\llbracket \beta \rrbracket$ and $\llbracket \gamma \rrbracket$ are both in $D_{\langle e, t \rangle}$, then

$$\llbracket \alpha \rrbracket = \lambda x \in D_e. \llbracket \beta \rrbracket(x) = \llbracket \gamma \rrbracket(x) = 1.$$

It is possible to examine certain pairs that differ minimally in that one member of the pair appears to combine with the modified noun following (1), while a related form combines with the modified noun without making $\llbracket \text{Adj N} \rrbracket(x) = 1 \leftrightarrow \llbracket \text{Adj} \rrbracket(x) = 1 \wedge \llbracket \text{N} \rrbracket(x) = 1$ true. We begin with an example from Russian.

Russian adjectives come in two forms: one more verblike, the short form, which can only come in predicate position; the other, the long form, can appear both prenominally as an attributive, or predicatively. When used predicatively, the long form adjectives contrast with short form adjectives in a subtle way:

- (2) a. Studentka umna. (SF: intelligent in general)
b. Studentka umnaja. (LF: intelligent as a student)
student intelligent
- (3) a. Oleg umen. (SF: intelligent in general)
b. Oleg umnyj. (LF: intelligent at something)

This contrast can also be observed in the English sentence (4a), which has the readings (4b) and (4c). In the literature, the reading in (4c) has been called *intersective*, owing to the fact that the function denoted by the predicate is the intersection of that which is denoted by its constituent parts. The reading in (4b), termed *nonintersective*, poses interesting problems for semantic composition, which we will attempt to address here.

- (4) a. Olga is a beautiful dancer.
 b. Olga dances beautifully.
 c. Olga is beautiful and a dancer.

We should distinguish the nonintersectivity of the preceding examples from comparison-class relativity. Adjectives such as “small”, “ugly”, etc., also fail to make true the equivalence $\llbracket \text{Adj N} \rrbracket(x) = 1 \leftrightarrow \llbracket \text{Adj} \rrbracket(x) = 1 \wedge \llbracket \text{N} \rrbracket(x) = 1$, but for a slightly different reason. “E39 is a small building” doesn’t imply that “E39 is small” in any absolute sense, but only with respect to a contextually salient class of entities. We will not address this characteristic at all here.¹

There are at least two ways in which one could begin to analyse the facts of non-intersective adjectives. Larson (1998) refers to the first of these, developed in Siegel (1976), as the A(djective)-analysis. In this approach, non-intersective adjectives are proposed to be a class of words of a type other than $\langle e, t \rangle$, namely one that takes as argument the intension of a predicate, and yields another predicate. The approach defended in Larson (1998), and characterized by him as a N(oun)-analysis, proposes that common nouns generally take two arguments, one of type e , and the other an event, and that adjectival modification obtains through the usual PM rule, though in this proposal it is ambiguous whether it composes to modify the individual-type argument or the event argument.

In the following sections, we give some details on the workings of these two approaches. For the time being, we will just note that these two ways of viewing nonintersectivity in adjectival modification tie in with two different views of the amount of intensionalization that goes on in semantic composition. Siegel’s A-analysis fits with Montague’s general approach, where functional application was inherently intensional. Larson, on the other hand, restricts intensional functional application to clausal argument-taking functions, and endeavors to reduce other constructions where IFA has been proposed (of particular concern to us here, modification by a non-intersective adjective) to constructions with clausal arguments.

1.1 Long and short form adjectives in Russian

Let us for now return to Russian, since in this language the nonintersective and the intersective adjectives are argued by Siegel to be in correspondence with the two morphologically and syntactically distinct classes described above.

Siegel follows Montague in stating that categories that behave in a similar way syntactically will have similar semantics. Thus, short form adjectives, which behave syntactically as intransitive verbs, will be given intransitive verb semantics by this system. The relevant composition rules are the following:

¹Cf. Siegel (1976) and Larson (1999). Larson notes that the fact that comparison-class relativity and nonintersectivity in the sense of example (4) are independent phenomena is demonstrated by it being possible for them to cooccur, as in:

Gwen is a beautiful dancer for a four year old.

(5) **Rule for combining a term α with a predicate β**

a. *In the Syntax*

$F_2(\alpha, \beta) = \alpha$ byt'² β (if β has the feature [adj])

$F_1(\alpha, \beta) = \alpha\beta$ (otherwise – i.e., β is an intransitive V)

b. *In the Semantics*

$F_{1,2}(\alpha, \beta) = \alpha'(\wedge\beta')$ (where \wedge is the intension operator, and x' is the lexical entry for x)

Long form adjectives, which modify common nouns to yield common nouns, get the following composition rules:

(6) **Rule for combining an adjective α with a common noun β**

a. *In the Syntax*

$F_3(\alpha, \beta) = \alpha\beta$

b. *In the Semantics*

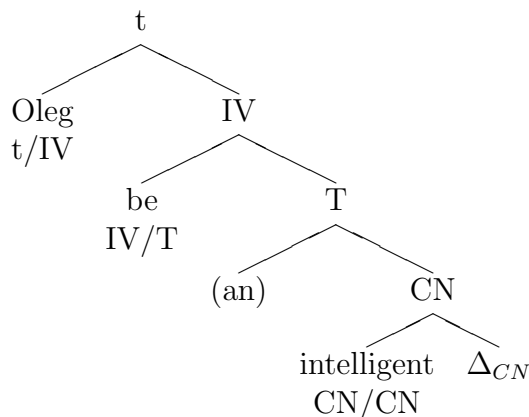
$F_3(\alpha, \beta) = \alpha'(\wedge\beta')$

Siegel notes that in the case of rule (5b), the intension operator (present “by default” in the composition rules of Montague’s system) factors out through rules that she herself doesn’t make explicit, while in (6b) the intension operator crucially remains. We can assume for the purposes of this paper that rule (5b) applies to extensions, rather than to intensions, as is typical of one place predicates in the system of Heim and Kratzer (1998). Implications between postulates involving adjectives are taken care of through meaning postulates, such as the following one, associated to qualitative adjectives:

(7) $[\alpha_{CN/CN}(\wedge\beta_{CN})_*](u_e) \rightarrow \beta_*(u)$ (i.e. intelligent student(x) \rightarrow student(x))

Siegel then has to address the fact that in Russian long-form adjectives can also be used predicatively. The proposal to deal with these is straightforward. An empty CN is postulated as the sister to the CN/CN adjective:³

(8) *Nonintersective adjectives used predicatively*



²The Russian copula.

³Semantic types used by Siegel include the following: T – term; CN – common noun; IV – intransitive verb; t – truth value.

“Oleg is intelligent (at something).” = “Oleg is (an) intelligent (something).”

The *be* used in this tree is a phonetically null *be* “of identity”, semantically distinct from the vacuous *be* inserted by rule (5a). The sense of the common noun Δ is given by context.

Siegel asserts that her double category analysis of adjectives has the empirical advantage of pairing up the syntactic generalizations about the distribution of adjectives in Russian with generalizations about their meaning. The analysis has nevertheless one major flaw, which is not addressed in her thesis: if only long form adjectives are permitted prenominal, one would predict that there is no intersective modification within Russian NPs, a very unlikely conclusion. It is certainly possible for Siegel to get the intersective readings for prenominal adjectives through meaning postulates that apply to only those adjectives that can function intersectively, or by a syntactic transformation that derives long forms from underlying short-form predicates, but these moves would completely undermine the alleged correlation between the syntax and the semantics of adjectives in Russian.

1.2 A doublet theory for English adjectives

We do not need to conclude that Siegel’s flawed analysis of Russian implies that her double category theory of adjectives is inadequate as a whole. In what follows, we sketch Siegel’s analysis of English adjectives.

In English, both intersective and non-intersective readings are possible in both the prenominal and the predicate positions:

- (9) a. That lutist is good.
 b. That is a good lutist.

One generalization about English is nevertheless reminiscent of the Russian facts: adjectives that appear only prenominal are always non-intersective (veteran, rightful, main), whereas adjectives that appear only predicatively are always intersective (alive, agape, touched). For the vast majority of adjectives in English that can have both intersective and non-intersective meanings no matter what their position, Siegel rejects the possibility that the two senses could be somehow related, and asserts instead that there are doublets for all of these, with one member of the pair belonging to the nonintersective class CN/CN, the other to the intersective class $t///e$.⁴

Like in the analysis of Russian, CN/CN adjectives in English can only be generated prenominal, while $t///e$ adjectives can only be generated as predicates. To get $t///e$ adjectives in prenominal position, a semantically vacuous rule whose input is a relative clause applies:

$$(10) \text{ CN}_1 \left\{ \begin{array}{l} \text{which} \\ \text{that} \end{array} \right\} \text{ be ADJ}_{t///e} \rightarrow \text{ADJ}_{t///e} \text{ CN}_1$$

⁴In Montague’s notation, A/B, A//B and A///B are categories that have similar semantics but different syntax. Intersective adjectives ($t///e$) are thus semantically identical to intransitive verbs (t/e), but are nontrivially different from them as far as their syntax goes (contrary to what occurs in Russian).

CN/CN adjectives in predicate position derive from the same underlying structure that was proposed for Russian, with a dummy noun Δ serving to saturate the adjective. The following paradigm exemplifies all the possibilities found in English:

- (11) That lutist is good.
 a. That lutist is a $\text{good}_{\text{CN/CN}} \Delta_{\text{CN}}$.
 b. That lutist is $\text{good}_{\text{t///e}}$.
- (12) That is a good lutist.
 a. That is a $\text{good}_{\text{CN/CN}}$ lutist.
 b. That is a lutist who is $\text{good}_{\text{t///e}}$.

A prediction of this analysis is that when a dummy noun is present, as in (11a), there will be vagueness about what noun one is predicating of. In example (3b), we saw that in Russian, if the sentence does not provide a common noun with which a non-intersective adjective can compose, vagueness arises. Even though the ambiguity between t///e and CN/CN readings for adjectives in English slightly obscures the facts, this is nevertheless what happens also in this language. In fact, vagueness will arise in precisely the cases which have the underlying structure (11a), and any contextually salient CN will do to give reference to Δ , as Siegel shows: If one is watching several musicians play checkers, an utterance of (11) might well be taken to mean that the lutist is a good checker player.

2 An analysis with event arguments

In a number of recent papers, Richard Larson has explored an alternative and more restrictive account of adjectival semantics, based on the account of adverbial modification given by Davidson (1967). It is argued that all adjectives are basically intersective, and it is nouns that have a more complex structure that permits the “nonintersective” readings.

The main test identified by Siegel for nonintersectivity in adjectives goes as follows:

- (13) *Failure of implication*
 Suppose: $\{x : x \text{ sings}\} = \{x : x \text{ dances}\}$.
 Then: Olga sings \leftrightarrow Olga dances.
 But: Olga sings beautifully $\not\leftrightarrow$ Olga dances beautifully.
 Analysis: $(\text{beautifully}'(\wedge \text{sing}'))(\text{Olga}) \not\leftrightarrow (\text{beautifully}'(\wedge \text{dance}'))(\text{Olga})$

Siegel shows that this failure of implication follows from considering nonintersective adjectives to take noun intensions as their arguments. Larson (1998), following McConnell-Ginet (1982), contends that intensionalization is not the only way to get the implication failure in (13). Instead, he presents the following schema:

- (14) *Failure of implication*
 Suppose: $\{x : x \text{ eats}\} = \{x : x \text{ cooks}\}$.
 Then: Olga eats \leftrightarrow Olga cooks.

But: Olga eats fish $\not\leftrightarrow$ Olga cooks fish.
Analysis: $\text{eat}'(\text{fish}, \text{Olga}) \not\leftrightarrow \text{cook}'(\text{fish}, \text{Olga})$

Larson argues that (14) is an intuitively more satisfactory account than (13) for the failure of implication that goes on with nouns modified by nonintersective adjectives. It is also worth noting that the implication in (13) fails even if the set of dancers and the set of singers are identical in *all* possible worlds; thus, even with identical intensions for “dance” and “sing”, it still is not necessarily true that the set of individuals that dance beautifully is identical to the set of those that sing beautifully. The conclusion is that nonintersectivity in adjectives might be more appropriately thought of as following from “hidden relationality” than from intensionalization of the noun.⁵

2.1 An event semantics

In the system of Davidson (1967), verbs such as “sing” and “dance” are not simple one-place predicates. Rather, they take an extra event argument e .⁶ It is fairly straightforward to see how this event argument is used in predicates:

- (15) Olga danced beautifully.
 $\exists e[\text{dancing}(\text{Olga}, e) \wedge \text{beautiful}(e)]$
- (16) Olga dances beautifully.
 $\Gamma e[\text{dancing}(\text{Olga}, e) \rightarrow \text{beautiful}(e)]$

In example (16), the “generic quantifier” Γ , which will be relevant in event-analysis of NPs, is introduced. (16) should be read as: “Generally, for events of the relevant type that are dances by Olga, they are beautiful.”

Larson (1998) makes several technical moves to extend the event-argument analysis to NPs. These amount to the following:

1. Include an event argument in the semantics of common nouns.
2. Analyse all adjectives as predicates.
3. Allow adjectives to predicate of any of the arguments of a common noun.
4. Achieve an appropriate mapping between the semantics and the syntax of the NP, especially as regards the position of the quantifier over events, its restrictor, and its nuclear scope.

We will briefly address each of these moves in turn.

⁵Even having said this, it is still very hard to think about certain adjectives as containing hidden relationality: *fake* is one example that comes to mind. Not surprisingly, Larson concentrates on adjective-noun pairs that have semantic equivalents in adverb-verb constructions.

⁶At the beginning of this squib we used e to stand for individuals. Other than that one time, we use e to stand for events.

2.1.1 Event arguments in time-sensitive nouns

Larson assumes for nouns such as “dancer” a semantics identical to that of the verb “to dance”; this means that the event variable is introduced by the lexical entry of the noun itself.⁷ In Larson’s notation:

$$(17) \quad \text{Val}(\langle e, x \rangle, \text{dancer}) \text{ iff } \text{dancing}(e) \wedge \text{Agent}(x, e)$$

The event variable of the noun is bound within the NP by a generic quantifier for which he gets evidence from contrasts between stage-level vs. individual-level modification in nominals, a matter into which we will not go here.

2.1.2 All adjectives are intersective

In examples (16) and (15), the adverbial enters the semantics by modifying the event variable. Larson proposes that the “nonintersective” reading of the adjectival modification found in (22a) is just intersective modification of the event argument of the noun. Larson’s strong hypothesis is that all adjectival modification is intersective, a large part of the so-called “nonintersective” modification actually being modification of the event argument.⁸

It is thus argued that adjectives that are sisters to a noun have the option of modifying either the event argument or the individual argument. The fact that some adjectives only function as individual modifiers (those formerly called intersective) while others only function as event modifiers (formerly nonintersective) is a fact about pragmatics: it is simply nonsensical, it is asserted, for events to be aged, as it is for individuals to be former. This is not entirely clear, however, since it would predict that event-denoting nouns could serve as subjects of adjectives such as former.

The composition rules for adjectivally-modified NPs are thus:

$$(18) \quad \begin{array}{l} \text{a. } \text{Val}(\langle x, e \rangle, [\text{NP AP NP}]) \text{ iff } \text{Val}(\langle x, e \rangle, \text{NP}) \dots \text{Val}(x, \text{AP}) \text{ (for entity modification)} \\ \text{b. } \text{Val}(\langle x, e \rangle, [\text{NP AP NP}]) \text{ iff } \text{Val}(\langle x, e \rangle, \text{NP}) \dots \text{Val}(e, \text{AP}) \text{ (for event modification)} \end{array}$$

The dots in the composition rules are apparently meant as a placeholder for \rightarrow or \wedge , which will be filled in according to the quantifier that closes the event variable. The following is a lexical entry for an adjective, where C is the contextually supplied comparison class argument.

$$(19) \quad \text{Val}(x, \text{good}) \text{ iff } \text{good}(x, C) \text{ (“}x \text{ is good for a } C\text{”)}$$

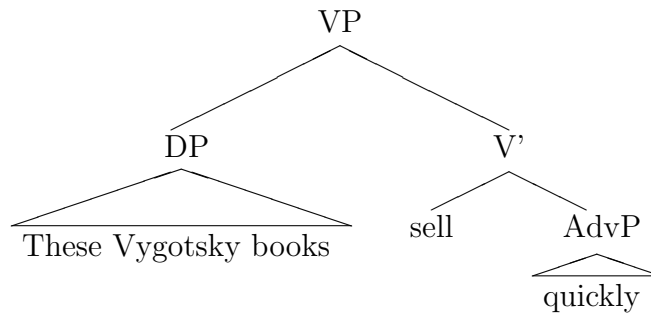
⁷This is relevant to note, since below we will address one case where the event variable is introduced constructionally.

⁸For some adjectives, such as *utter*, Larson suggests that additional hidden variables, e.g. degree, might need to be posited.

2.1.3 Getting the scope and restrictor in the right place

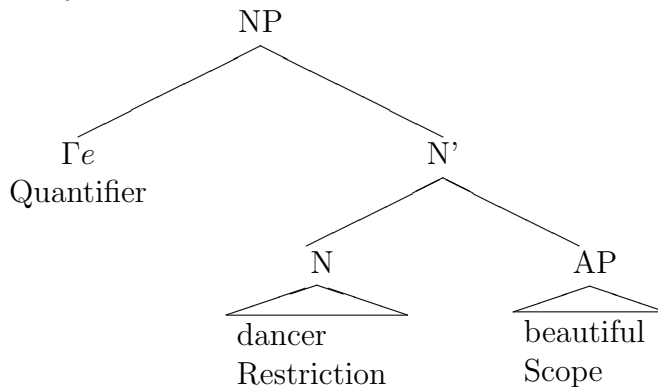
It is generally assumed that the restrictor for a quantifier is going to be mapped from material that is higher up in the tree than the quantifier’s nuclear scope. If the LF for “The flowers grow quickly” is $\Gamma e[\text{Con}(e, \text{flower}) \wedge \text{growing}(e, \text{flower})][\text{quick}(e, C)]$, then assuming the traditional view where adverbials are adjoined to VP or higher is problematic. Instead, one can assume the VP to be like the following structure:⁹

(20) *VP with low adverbial*



Similarly, NPs can be posited to have the following structure. One could ask if there are any grounds for the analogy with middles other than the fact that we need the adjective to be mapped to the nuclear scope in the semantics; this is a question to which I don’t have an answer at this point.

(21) *NP syntax to match the semantics*



⁹This structure proposed by Condoravdi (1989) for analyzing middle voice constructions. The known fact that adverbials are necessary in the middle derives from adverbials actually being the nuclear scope of sentential event quantification:

- (1) a. These Vygotsky books sell quickly.
- b. ? These Vygotsky books sell.
- (2) a. This bread cuts easily.
- b. ? This bread cuts.

3 NP internal adjectives with VP scope

It is probably evident that the move of introducing events in NPs will encounter problems when we look at any noun that is not strictly deverbal. One of these can be seen in the following examples, due to Vendler (1967):

- (22) a. John is a just ruler.
b. John rules justly.
- (23) a. John is a just king.
b. *John kings justly.

Vendler suggests that the ungrammaticality of (23b) is due to an accidental gap in the lexicon. Nevertheless, it seems that examples such as (23) are just a special case of a type of construction where the modified event is implied, and is not always amenable to be derived by verbalizing the noun. Moreover, as (24c) shows in comparison to (23b), the implied event is not unique to a noun: “to king” in (23b) would have to mean “to rule”, whereas in (24c) it would mean “to be king”.

- (24) a. Oleg is a fast horse. \neq *Oleg horses fast.
b. There are hourly trains to New York. \neq *There/it trains hourly to New York.
c. Oleg is the rightful king. \neq *Oleg kings rightfully.

Let us now turn to an interesting question that arises when we assume for all theories of the adjective reviewed so far, but appears in an interesting light when viewed from a theory where nominals contain events.

In some cases, adjectives within an NP appear to be scoping outside of it to modify the main verb:

- (25) a. I drank a quick cup of coffee. = I quickly drank a cup of coffee.

In Spanish these sentence-scope adjectives are only perfect in light verb constructions, with increasing infelicity as verbs become more contentful (though we only note all the possibilities for placement of the adjective in example (26c), placing the adjective prenominally in the other examples does not seem to influence the felicity of the construction):¹⁰

- (26) a. Me doy una ducha rápida.
myself give a shower quick
'I take a quick shower.'

¹⁰In Spanish, the masculine form of some adjectives can serve as an adverb, as in

Vení rápido.
Come quickly!

The choice of only feminine nouns below guarantees that the modifiers are NP internal.

- b. Hago/Duermo una siesta rápida.
do/sleep a nap quick
'I take a quick nap.'
- c. ? Me tomo una (rápida) taza (rápida) de café (rápida).
myself take a quick cup quick of coffee quick
'I take a quick cup of coffee.'
- d. ?? Veo una película rápida.
see a movie quick
- e. * Visité una ciudad rápida en Turquía.
visited a city quick in Turkey

While the English equivalent of (26e) is also infelicitous, English seems to be generally more permissive of constructions such as these than Spanish, and they are not limited to light verb constructions. Let us concentrate on a couple of examples which resist analysis as light verb constructions:

- (27) a. May I serve you a quick cup of coffee?
- b. I brought you some recent letters of John's.

In (27a), quick can be a modifier of "serve", but more saliently it modifies an implicit "drink". The possibility of this modification might be correlated to the capability of compound adjectives formed with gerunds in English, such as "easy-listening", "quick-growing", "wrong-thinking", etc. Whatever the structure of these is, one can propose that a phonetically empty verb Δ appears in the examples in (27) in a position analogous to "listen" in "easy-listening". This Δ 's interpretation is contextually determined.

We will assume the structure of NP described in section 2.1.3. In analogy with the semantics of "beautiful dancer" in (28a), we would like "quick cup of coffee" to have the LF in (28b):

- (28) a. $\Gamma e[\text{Con}(e, x) \wedge \text{dancing}(e, x)][\text{beautiful}(e, C)]$
- b. $\exists e[\text{Con}(e, x) \wedge \Delta(e, x) \wedge \text{cup of coffee}(x)][\text{quick}(e, C)]$

We should now ask whether vagueness arises in the constructions that have the abstract verb Δ . (27a) shows that Δ doesn't need to be filled in by the verb present in the sentence, but it seems difficult to allow Δ to refer to just any contextually salient predicate:

- (29) a. It was freezing this morning; the coffee got cold before we could drink it.
My cup of coffee was quick (quick-cooling).
- b. I threw away some letters that were on your desk.
The recent (recently thrown away) ones might still be on the garbage bag.

This suggests that our analysis might not be quite on the right track. There might be a selectional restriction imposed by the noun on Δ that limits it to be chosen only among the noun's typical functions. If this is true, we are closer to Vendler's suggestion for (23), even though, as we saw, a noun cannot map to a single typical-activity/use-denoting verb.

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