Lecture 9. Issues in the Semantics of Adjectives

1. The puzzle of privative adjectives.

1.1. Early formal semantics treatments of adjectives

In Lecture 4 we discussed the semantic treatment of adjectives found in Montague (1970), built on and/or similar to that in (Clark 1970, Kamp 1975, Parsons 1970). The central claim in that work was that adjective meanings should be analyzed as functions from properties to properties. Among adjective meanings, some might satisfy further constraints such as intersectivity or subsectivity, but no such constraint can be imposed on the class as a whole, because of adjectives like false, ostensible, alleged.

Kamp and Partee (1995) review the more or less standard “hierarchy” of classes of adjectives. The hierarchy ranges from intersective adjectives like carnivorous to privative adjectives like counterfeit, fake, and fictitious. The same article makes some proposals for coercion of adjective meanings in context, driven by certain general constraints, which help to explain a number of kinds of shifts and adjustments that take place when adjective-noun combinations are interpreted in various kinds of contexts – we’ll discuss some of that in the second half of today’s lecture.

Today in the first half of the lecture I want to go over arguments in (Partee 2009, Partee 2010) that in fact adjective meanings are more constrained than was appreciated either at the time of the work of Montague, Kamp, Parsons and Clark or at the time of the work of Kamp and Partee. In particular, I have argued that some facts about the possibility of “NP-splitting” in Polish (Nowak 2000) cast serious doubt on the standard hierarchy, and that the data become much more orderly if privative adjectives like counterfeit, fake, and fictitious are reanalyzed as subsective adjectives. Further evidence for that move comes from long-standing puzzles about what to say about sentences like Is that gun real or fake?
1.2. Adjective classification

First let’s briefly review the “hierarchy” of adjective classifications as related to formal/lexical integration (Kamp and Partee 1995, Partee 1995). The hierarchy in (1) goes from “simplest” to “most complex”.

(1) Hierarchy:  Intersective -- Subsective -- Non-subsective Plain -- Privative

**Intersective**: An adjective like *carnivorous* is **intersective** (Parsons: *predicative*), in that Meaning Postulate (2) holds for any N.

(2) \[ ||carnivorous \, N|| = ||carnivorous|| \cap ||N|| \]

**Subsective**: *Skillful* is not intersective, but it is **subsective** (Parsons: *standard*): (3) holds for any N.

(3) Subsectivity: \[ ||skillful \, N|| \subseteq ||N|| \]

**Nonsubsective**: **Nonsubsective** adjectives may either be “plain” (**modal**) nonsubsective (no entailments at all, no meaning postulate), or **privative**, entailing the negation of the noun property. The meaning postulate for privative adjectives is stated informally in (4).

(4) \[ ||counterfeit \, N|| \cap ||N|| = \emptyset \]

The **privative** adjectives (*fake, counterfeit*) have a “negative” meaning postulate; a *fake gun* is not a *gun*.

On this familiar classification, adjectives are seen as forming a hierarchy from intersective to subsective to nonsubsective, with the privative adjectives an extreme case of the nonsubsective adjectives.

1.3. Are privative adjectives really privative?

This material comes from (Partee 2009, Partee 2010).

Among many other debated points, one which has always been troubling, and to which we now turn, is the question of whether an adjective or adjectivally used noun like *fake* or *toy* is really privative. One nagging problem is the evident tension between the apparent truth of (1a) and the undeniable well-formedness and interpretability of (1b).

(1) a. A fake gun is not a gun.

b. Is that gun real or fake?

1.3.1. Modal and privative adjectives and NP-splits

The phenomenon of “split NPs” (прерывающиеся именные группы) in Slavic was first brought to my attention by Anita Nowak in a student paper (Nowak 2000). It has been studied by a number of scholars, including (Bašić 2004, Fanselow and Ćavar 2002, Gouskova 2000, Junghanns 2000, Kučerova 2007, Markovskaya 2007, Mehlhorn 2000, Sekerina 1997, Siewierska 1984), and especially Pereltsvaig (2008).

The printed version of Partee (2009) uses Polish examples, mostly from Nowak; here, as in the presentation slides at DIALOG 2009 ([https://udrive.oit.umass.edu/partee/Partee2009_Trondheim_Adjectives.ppt.pdf](https://udrive.oit.umass.edu/partee/Partee2009_Trondheim_Adjectives.ppt.pdf)) I will
include a number of Russian examples from Pereltsvaig (2008 and p.c.), Trugman (p.c.), and Polish examples from Rozwadowska (p.c.), making the data somewhat richer.

Typical examples, “direct” and “inverse”:

(8) Чёрный он любит кофе. (Sekerina 1997)
(9) Кофе он любит чёрный.

Polish examples from Nowak (2000)

(10) (a) Kelnerki rozmawiały o przystojnym chłopcu.
    Waitresses talked about handsome-LOC boy-LOC
    ‘The waitresses talked about a handsome boy’

(11) (a) Włamano się do nowego sklepu.
    broke-in REFL to new-GEN store-GEN
    ‘Someone broke into the new store.’

Some adjectives can easily split, some cannot.

Nowak’s judgments: intersective, subsective, and privative (!), easily enough. Non-subsective modal adjectives: NO.

(12) Do rozległej weszliśmy dolinę.
    to large-GEN (we) entered valley-GEN
    ‘We entered a large VALLEY.’

(13) *Z potencjalnym widzieli się kandydatem.
    with potential-INSTR (they)saw REFL candidate-INSTR
    ‘They met with a potential CANDIDATE’

But: Others disagree about modal adjectives; the data are more complex, in Polish and in Russian.

Some NP-splits with modal adjectives are fine, some not.

(13) O potencjalnych rozmawialiśmy korzyściach.
    They talked about potential benefits. (Rozwadowska, p.c.)

(14) O domniemanych rozmawiano przestępcach.
    (They) talked about alleged criminals. (Rozwadowska, p.c.)

(15) *Domniemanych spotkaliśmy złodziei.
    We met alleged thieves. (Rozwadowska, p.c.)

(16) Потенциальным он был кандидатом, не более того! (Trugman, p.c.)

(17) Предполагаемых они арестовали уже пять убийц, а вот есть среди них настоящий, кто знает? (Trugman, p.c.)

(18) Ожидаемые не наступили перемен, хотя ожидали их долго и терпеливо. (Trugman, p.c.)
NP-splits: Pereltsvaig’s generalization.
Pereltsvaig (2008), using a substantial corpus of colloquial Russian, with intonation patterns verifiable for a good part of it (including movies and their scripts), has reached the following conclusions, among others:

A. In NP-splits, the first segment is either a contrastive topic or a contrastive focus (контрастная тема / рема)

B. The same word orders are possible for contrastive topic examples and contrastive focus examples.

C. Intonation reliably distinguishes the two types:
   • for contrastive focus, ИК-2;
   • for contrastive topic, Pereltsvaig (2008) calls it ИК-5, but Tanya Yanko (p.c.) says it’s actually ИК-3 (+ИК-1 on the focus).

Illustrations (Pereltsvaig 2008)
Contrastive focus: ИК-2, with scrambling or with split NP.
(19) Малинового варенья она мне прислала! (а не клубничного)
(20) Малинового она мне прислала варенья! (а не клубничного)

Contrastive topic: with scrambling or with split NP.
(21) Малинового варенья она мне прислала! (а клубничного Саше)
(22) Малинового она мне прислала варенья! (а клубничного Саше)

Observation (Pereltsvaig, p.c.): In all the good Russian examples of split NPs with modal adjectives, the modal adjective must have contrastive focus; other adjectives have no such restriction.

So what is the right generalization?
The correct generalization is not that modal adjectives can never split, but that modal adjectives (on their modal meanings) cannot split except when they are contrastively focused. So (16-18) should either be ‘bad’, or possibly OK with contrastively focused adjective (with ИК-2). What do you think? (Russian speakers at DIALOG 2009 agreed.)
(16) Потенциальным он был кандидатом, не более того! (Trugman, p.c.)
(17) Предполагаемых они арестовали уже пять убойц, а вот есть среди них настоящий, кто знает? (Trugman, p.c.)
(18) Ожидаемые не наступили перемен, хотя ожидали их долго и терпеливо. (Trugman, p.c.)

The generalization so far: intersective and subsective adjectives can freely participate in NP-split constructions. But modal adjectives are more restricted; they cannot split freely, although it seems that they can split when they are the contrastive focus.

But now let’s look at the privative adjectives.
It turns out that privative adjectives are as easy to split as intersective and subsective ones!
Polish privatives easily split, in both contrastive topic and contrastive focus constructions: *fikcyjny* (fictitious), *wymyślony* (imaginary), *fałszywy* (fraudulent). Examples from B. Rozwadowska (p.c.):

(23) *Falszywy* był to alarm.  
False was it alarm

(24) *Falszywe* znaleźliśmy banknoty.  
False (we) found banknotes

(25) *Fikcyjne* zawarła małżeństwo.  
Fictitious (she) signed marriage

Russian privative adjectives *фальшивый*, *мнимый*, *бывший* also can easily split, whether contrastive topic or contrastive focus motivates the split:

(26) *Фальшивый* он получил диплом. (H. Trugman, p.c.)

(27) *Мнимые* нам не нужны герои! (H. Trugman, p.c.)

(28) *Бывший* к ней приехал муж (... и устроил сцену.) (H. Trugman, p.c.)

Another important fact is that the ones that cannot split also cannot occur predicatively, and the ones that can, can.

**The puzzle:** this is inconsistent with the “hierarchy”; the ones that split easily do not form a natural class.

Intersective > Subsective > Modal > Privative

It is unexpected for the intersective, subsective, and privative adjectives to pattern together, while the non-subsective adjectives that are “noncommittal” (and which can reasonably be characterized as “modal”), cannot participate in the NP-split.

### 1.3.2. Principles of interpretation and the “no privative adjectives” hypothesis

The hypothesis I propose is that the adjective-split data provide a clue that the adjectives *fake* and *imaginary* aren’t actually privative, but subsective, and that no adjectives are actually privative.

Recall our puzzling example (1b):

(1b). Is that gun real or fake?

In interpreting a question like (1b) or a sentence like (2) below, I hypothesize that we actually expand the denotation of ‘fur’ to include both fake and real fur.

(2) a. I don’t care whether that fur is fake fur or real fur.

b. I don’t care whether that fur is fake or real.

In fact, even in (1a), it is reasonable to suppose that the first occurrence of *gun*, modified by *fake*, is similarly coerced, whereas the second, unmodified, occurrence is not. Normally, in the absence of a modifier like *fake* or *real*, all guns is understood to be real guns, as is evident when one asks how many guns the law permits each person to own, for instance. Without the coerced expansion of the denotation of the noun, not only would *fake* be privative, but the adjective *real* would always be redundant.

1 This property of *real* is noticed in passing by Lakoff (1987, p.75).
Kamp and Partee (1995), in discussing the “recalibration” of adjective interpretations in context, introduced a number of principles, including the following “Non-Vacuity Principle”.

(3) **Non-vacuity principle (NVP):**

In any given context, try to interpret any predicate so that both its positive and negative extension are non-empty. (Kamp and Partee 1995, p.161)

The Non-Vacuity Principle applies not only to simple predicates but to predicates formed, for instance, by combination of an adjective and a noun: these should be interpreted in such a way that the ADJ + N combination is a non-vacuous predicate.

However, Kamp and Partee (1995) also argued, in part on the basis of clear examples like (4), that in ADJ + N constructions, one first interprets the noun in the given context (ignoring the adjective), and then “recalibrates” the adjective as necessary. This principle is expressed as the “Head Primacy Principle” in (5).

(4)

a. giant midget (a midget, but an exceptionally large one)

b. midget giant (a giant, but an exceptionally small one)

(5) **The Head primacy principle (HPP):** In a modifier-head structure, the head is interpreted relative to the context of the whole constituent, and the modifier is interpreted relative to the local context created from the former context by the interpretation of the head.² (Kamp and Partee 1995, p.161)

In many cases, the Non-Vacuity Principle and the Head Primacy Principle cooperate to account for the observed results, including not only the examples in (4), but also the fact that the truth of (6b) below is compatible with a non-redundant use of the modifier in (6a).

(6)

a. This is a sharp knife.

b. Knives are sharp. (Kamp and Partee 1995, p.162)

If the Head Primacy Principle is absolute, the proposed shift in the interpretation of the head noun under coercion by a privative adjective like *fake* or a “tautologous” adjective like *real* would be impossible. But there are other examples as well that suggest that the Head Primacy Principle probably has to be seen as non-absolute. In particular, there is a large and productive class of “constitutive material” modifiers that occur in examples like stone lion, wooden horse, velveteen rabbit, rubber duck. It is evidently so easy to shift nouns from their literal meaning to a meaning “representation/model of …” that we hardly notice the shift.

Without trying to formalize this idea (which might have a natural expression within Optimality Theory), I would suggest the following. We normally try to obey both the Head Primacy Principle and the Non-Vacuity Principle. But if there is no reasonable way to obey the Non-Vacuity Principle without shifting the noun outside its normal bounds (as in the case of *fake* and *real*), then it may be shifted in such a way as to make the compound predicate obey the Non-Vacuity Principle. (Since this is always necessary with privative and “tautologous” modifiers, there might even be something in their lexical semantics that particularly indicates the need to shift the head to which they apply.) And if there is an extremely productive and “easy” shift of the noun that would make it easy to satisfy the Non-

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² “In the simplest cases, the effect of the interpretation of a head noun on a given context will be to restrict the local domain to the positive extension of the head in the given context.” (Kamp and Partee 1995, p.161, fn.23)
Vacuity Principle, as in the case of the “representations” in wooden horse, etc., there too we can override the Head Primacy Principle.

And I would suggest that no adjectives are privative. “Normal” adjectives are always subsective, and there should be some ways to identify “modal” adjectives as a special subclass, such that only they are not necessarily subsective.

If this hypothesis can be maintained, then the classification of adjectives would be much more neatly constrained. Adjectives would still be functions from properties to properties in the most general case, but in harmony with the traditional notion of modifiers, they would normally be constrained to be subsective. We still need to allow for the ‘modal’ adjectives, which are not so constrained; the Polish data would provide fuel for a proposal to consider them syntactically as well as semantically distinct. Of course more work also needs to be done on the detailed lexical semantics of each of the putatively privative adjectives, since they are far from identical.


2.1. The RS Hypothesis

Galit Sassoon has done a lot of work on the semantics of adjectives, and has recently (Sassoon 2011) developed and tested an interesting hypothesis about the semantic difference between nouns and adjectives. She offers not only linguistic arguments but also corpus studies, language processing evidence, and evidence from language acquisition. The main languages she has looked at are Hebrew, English, French, and Spanish; as she notes in the longer, unpublished, version of her paper, there are many more questions to be asked and a need for a wider cross-linguistic investigation. But her work looks very interesting and plausible. This section of the handout is based almost entirely on that paper.

She starts by observing, as we did last week, that semanticists have argued that the main distinguishing feature of verb semantics is an event argument. But there has not been as much work on distinguishing adjectives from nouns, beyond the informal idea that nouns denote ‘object categories’ and adjectives denote ‘properties’, which has no clear formalization.

Her hypothesis rests on a distinction that comes from cognitive studies of categorization. That literature distinguishes two quite different types of categorization, with different neural and developmental correlates: Rule-based categorization and Similarity-based categorization. Her hypothesis, which she calls the Rule vs Similarity (RS) hypothesis, is that Adjective semantics involves Rule-based categorization, while Noun semantics involves Similarity-based categorization.

Rule-based categorization.

Example: healthy. The adjective healthy involves various ‘dimensions’, including blood pressure, cholesterol level, blood sugar level, etc. To be healthy generally involves meeting a certain standard on all of those dimensions (or all the ones that are relevant in a given context.) The ‘negative’ adjective sick involves similar ‘dimensions’; to be sick generally means falling below some standard on at least one of those dimensions.

More generally: A rule based categorization for a multi-dimensional category “amounts to integration of dimensions through logical operations, such as those denoted by and and or” (as seen in the all and at least one conditions for healthy and sick.)
Similarity-based categorization.

Similarity-based categorization goes back to prototype theory, whose origins go back to (Wittgenstein 1953) and which became well known in cognitive science and linguistics especially through the work of Eleanor Rosch (Rosch 1973, Rosch and Mervis 1975); see also (Kamp and Partee 1995, Lakoff 1987, Smith et al. 1988, Taylor 1995).

Example: bird, chair. [Sassoon’s paper uses bird, with footnotes explaining why she considers it reasonable to treat bird this way, in spite of the possibility that it may well be a natural kind term as argued by Putnam (1975a, 1975b).] Psychological experiments suggest “that the conceptual structure of this noun includes a rich cluster, F(bird, c), of dimensions (where c is a variable over contexts), which is called the prototype of the concept. It may include features like ‘bird-genotype’, ‘bird descendant’, ‘can interbreed with birds’, ‘winged’, ‘feathered’, and ’small’. Each dimension F in F(bird, c) has an “attention weight W_F. … The conceptual structure includes an ideal value on each dimension, so for example \text{deg(bird, size, c)} represents the ideal size for birds (in context c).”

In considering whether an entity falls under the concept bird or not, that entity is evaluated for its similarity to the prototype, which can be formalized using a ‘similarity structure’ that will compute the weighted values of the attributes of the entity with respect to the features that make up F(bird, c), ending up with a degree, \text{deg(x, bird, c)}, the degree to which entity x is similar to the prototypical bird in context c.

The big difference between the computation of similarity to a prototype and what happens with an adjective like healthy is that instead of requiring that x meet a given standard on each of the features in the bird-prototype, “the degrees of an entity in the different bird dimensions integrate into a unique degree in the given noun by means of similarity functions.” This is normally done by an averaging operation, or via a ‘weighted product’; degrees are modeled on a scale from 0 to 1 for individual dimensions and for the overall result. “Averaging on dimensional degrees captures the fact that, by and large, no single dimension is a necessary or sufficient condition for falling under a noun (Wittgenstein 1953); rather, the membership condition requires that the average degree of entities in the dimensions exceed a certain threshold.”

This is different from the “logical operations” used to integrate dimensions with an adjectival concept like healthy. A person with influenza doesn’t count as healthy just because they might happen to have excellent blood pressure and low cholesterol; it’s not the “average” that matters, but meeting the contextually given standard on all features or dimensions. Tweety, on the other hand, can count as a bird even if Tweety can’t fly, as long as the weighted average of ‘bird properties’ comes out high enough (and Tweety’s score relative to competing categories like mammal comes out lower than Tweety’s bird score.)

“In sum, the name similarity highlights reference to an ideal, but the defining characteristic binding the multiple and variable accounts within the similarity approach is the rejection of logical dimension integration, in favor of non logical functions such as weighted sums and products (averaging). In fact, the similarity based approach came into being as a response to ‘the classical theory’, namely a family of accounts that are bound together by the use of logical dimension-integration operations, such as conjunctions and disjunctions (Lakoff 1987, Ch.1, Murphy 2002).” (pp7-8 in the unpublished draft version.)
What such predicates have in common on this view: all gradable, though in different ways.

We have by now specified all the ingredients of predicate interpretation. Formally, in each context $c$, each predicate $P$, whether a noun or an adjective, is associated with:

(i) a degree function, $\lambda x. \text{deg}(x, P, c)$, i.e. a mapping of entities $x$ to degrees $\text{deg}(x, P, c)$;
(ii) a standard of membership, $\text{s}(P, c)$, such that entities are $P$ iff their degree in $P$ exceeds $P$’s cutoff point in $c$, and
(iii) a set of predicates, $F(P, c)$, $P$’s dimensions in $c$, and their weights, and the ideal values for $P$, $W(P, F_i, c)$ and $\text{deg}(P, F_i, c)$, respectively, for each dimension $F_i$ in $F(P, c)$. (p.8)

Sassoon’s idea that both nouns and adjectives are gradable is a major departure from the standard approach on which gradability is a core semantic property that adjectives have and nouns lack (Kamp 1975, Kennedy 1999). She also disagrees with (Baker 2003), who treats nouns and adjectives as differing only in syntactic features that have no semantic content.

On Sassoon’s approach, both nouns and adjectives are gradable, but “the ways their dimensions are glued together differ fundamentally, resulting in rule vs. similarity categories.

(1) The Rule vs Similarity (RS) hypothesis for the noun-adjective distinction

a. Nouns denote similarity-based categories: They are associated with multiple dimensions (characteristic features) which are integrated through non-logical, similarity operations, such as averaging, at an early processing stage; for an entity to be classified under a noun, its average similarity, e.g., its weighted sum or product on the dimensions of the category or of one of its exemplars, should reach the membership standard.

b. Adjectives denote rule-based categories: They are associated with either a single categorization criterion, or a set of criteria integrated through logical operations, like conjunction and disjunction (or the respective quantifiers); thus, to count as an instance of an adjective, an entity has to reach the standard in either a single dimension or a dimension-conjunction or -disjunction. Processing of dimensions is explicit. (p.9)

Quoting from Sassoon (2011):

The basic motivation for the RS hypothesis is that it provides an attractive solution to the category vs. property puzzle related with the noun-adjective word class distinction. Why are nouns and adjectives intuitively seen as denoting ‘object categories’ and ‘properties’, respectively? Each object corresponds to a plurality of dimensional values. According to the rule vs. similarity (RS) hypothesis, more features of denoted objects are encoded as part of the interpretation of nouns than of adjectives. Thus, in designating overall similarity of objects in multiple dimensions, nouns are more readily associated with the denoted objects than adjectives are. What is more, according to the RS hypothesis, in usage of adjectives, but not nouns, speakers are aware of the dimensions. Thus, speakers experience nouns as directly designating object sets, while adjectives are experienced as designating single properties of objects. According to this new perspective, formal semanticists are correct in unifying the semantics of nouns and adjectives, both eventually denote object sets. At the same time, the intuitive category vs. property distinction suggest that intuitive differences reside in whether dimension integration involves explicit or implicit processing. (p.9)
A variety of additional consequences of the RS hypothesis are supported empirically. The basic prediction of the RS hypothesis is the following.

3) a. If nominal dimensions integrate through similarity, they do not add categorization criteria.
   b. If adjectival dimensions are rules, they function as categorization criteria.
   c. The different ways degrees are determined in adjectives and nouns yield differences in the range of degree modifiers they license.
   d. Explicit processing of the dimensions of adjectives, but not nouns, triggers licensing of an overt dimension argument and quantification over dimensions.
   e. The rule and similarity structures underlying adjectives and nouns yield neural and developmental differences. [In paper, she cites evidence that noun categorization is “fast processing”, automatic, and shows up in children very early; adjective processing is slower, more accessible to consciousness, acquired later.] (p.9)

2.2. Linguistic evidence.

Sassoon argues that her hypothesis is supported by the success of her prediction (3c), that “the different ways degrees are determined in adjectives and nouns yield differences in the range of degree modifiers they license.” (p.119 of published version)

Comparatives and equatives: Many adjectives, no nouns.

(4) taller than Dan, *as bird as Tweety.
Apparent counter-examples explained:
(5) This is more a truck than a car: a different construction.
(6) John is more of a genius than Bill. The added of may function similarly to a more typical genius than Bill, a better example of a genius than Bill.
Not direct comparison on the noun.

No degree modification of nouns by very, too, etc.
Why? Not because nouns are not gradable! But because the dimensions involved in nouns are not separately accessible; all the dimensions are normalized to a 0-1 scale, all are integrated fast and automatically at a very early stage of processing.

Multi-dimensional adjectives can take respect-phrases and except-phrases; nouns cannot.

(7) John is healthy in every respect (except blood pressure)
(8) *Fido is a dog in every respect (except that it doesn’t bark).
   Anomalous because the noun dimensions are integrated early, not separately accessible.
(9) #John is sick except for having excellent blood pressure.
   Anomalous because sick has existential quantification over dimensions, not universal, and except-phrases modify universally quantified statements.

Noun-adjective difference for except-phrases strongly supported by corpus studies.

Explainable exceptions: some de-adjectival nouns like similarity: can say similarity with respect to color. Also evaluative nouns like genius, idiot (these and other atypical adjectives and nouns are discussed in the last part of the unpublished paper, where she notes that “nominalizations form exceptions to almost any generalization about nouns, whether syntactic or semantic.”
Measure-modified comparatives: two degrees warmer, much happier. Why can’t nouns do this? Similarity-based classifications may give a ranking of entities in terms of closeness to ideal or prototype, but they do not give any measure of degree on different dimensions. For adjectives, the dimensions are accessible and ‘often measurable’.

Summary of neural and acquisition experiments conclusions:

(18) a. Rules are easy to reason about explicitly. Conversely, similarity-based criteria are hardly accessible through introspection.

b. Explicit, rule-based processing is more demanding, requiring working memory and executive functions, which recruit frontal-striatal circuits. Conversely, Similarity involves implicit procedural processing.

c. Children younger than 3 years old perform consistently on similarity-based processing tasks. By contrast, due to the late maturation of the prefrontal cortex [where adjectives appear to be processed, and where ‘rule-based reasoning’ is centered, by age 3 children tend to still have difficulties in consistently using rules, which only get resolved at age 5.

In sum, while more research is needed, this account seems to offer a promising way to account for both linguistic and psycho-neurological differences between nouns and adjectives.

References


