WHERE DO ALL THOSE OTHER ADJECTIVES COME FROM?

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I. Introduction

The standard transformational analysis of preposed adjectives in English derives them from reduced relative clauses. Thus, "the beautiful princess" is derived, by WHIZ Deletion and Adjective Preposing, from the same structure that underlies "the princess who is beautiful." However, there exist several sets of surface adjectives in English which this analysis cannot account for. Examples of such adjectives appear in (1), (2), and (3) below.[1]

1. a rural policeman	*that policeman is rural
a chemical engineer	*that engineer is chemical
a subterranean explorer	*that explorer is subterranean
bodily harm	*that harm is bodily
a corporate lawyer	*that lawyer is corporate
a dental appointment	*that appointment is dental
oceanic studies	*those studies are oceanic
2. a civil engineer	an engineer who is civil
a criminal lawyer	a lawyer who is criminal
a nervous system	a system which is nervous
a logical fallacy	a fallacy which is logical (?)
a constitutional amendment	an amendment which is constitutional
dramatic criticism	criticism which is dramatic
3. a total stranger	*the stranger was total
an utter fool	*a fool who is utter
a sheer fraud	*a fraud who is sheer
a true poet	*the poet is true
the main reason	*the reason is main
the prime suspect	*the suspect is prime
a principal cause	*the cause is principal
a former employee	*the employee is former
her eventual husband	*her husband who is eventual
a joint undertaking	*the undertaking is joint
an occasional visitor	*the visitor is occasional

The attributive adjectives in (1) cannot be derived from relative clauses, since they can never appear as predicate adjectives with the same nouns. (Some, like bodily, never appear in predicate position at all.) The attributive adjectives in (2) cannot be derived from relative clauses - at least not by the sort of meaning-preserving transformation we all hold so dear - because their

meaning in predicate position is completely distinct from their meaning in attributive position. And the attributive adjectives in (3) cannot be derived from relative clauses either, because they can never appear as predicate adjectives with any nouns.

Let me make clear my reasoning on this point. The observable fact that all these adjectives are in one way or another blocked from predicate position can lead us to make one of two theoretical conclusions. First, we might conclude that the syntactic and semantic anomaly that shows up on the surface is blocked from ever arising in the base, on the grounds that such a construction is not well-formed semantically. Our task would then be to figure out why it is ill-formed, and to propose an alternative, well-formed source. This is the theoretical approach I am working from. But a second theoretical point of view might allow such structures to be formed in the base, and to reach a shallow level of the derivation. Such a theory would then have to incorporate a mechanism to distinguish at a relatively shallow level of the derivation between relative clauses that can reach the surface, like "a policeman who is friendly," and those that will be blocked, such as "*a policeman who is rural."

The point is that with either of these theoretical approaches, the derivation of these adjectives from relative clauses leads to a serious complication of the grammar, which justifies our hypothesis that a derivation via reduced relative clauses is an unsatisfactory solution. We must therefore attempt to find transformational histories other than the standard analysis that will better account for all these adjectives. Let us call these adjectives, for want of a more inspired term, "nonpredicate adjectives."

II. Denominal Nonpredicate Adjectives

Let us first consider the nonpredicate adjectives in (1) and (2) above. My proposal is that these adjectives are derived not from underlying logical predicates as would be the case for true adjectives like big, long, pretty, or sharp -- but rather from underlying nouns, that is, logical arguments in the semantic structure. I am further proposing that these denominal adjectives, together with the nouns they modify, constitute compound noun phrases, precisely like compound NPs whose surface morphology comprises simply two nouns.

Consider the table in (4). The first column contains NPs consisting of nonpredicate adjectives and simple nouns. The second column shows the equivalent compound NPs with a N + N structure. These are, however, ungrammatical in most cases. (Where the NPs in this column are acceptable, they represent an alternative to the Adj + N phrase also in circulation.) The third column represents parallel compound NPs, whose N + N structure is grammatical.[2]

4. Nonpredicate Adj + N	N + N	Parallel Compound
electrical engineer	*electricity engin.	mining engineer
acoustic research	?sound research	seagull research
criminal lawyer	*crime lawyer	divorce lawyer
logical fallacy	*logic fallacy	
Canadian explorer	*Canada explorer	Yukon explorer
digestive system	*digestion system	communications system
electrical service	*electricity service	water service
matrimonial service	*matrimony service	matchmaking service
medical association	*doctor association	bar association
bodily damage	*body damage	brain damage
mental disease	*mind disease	kidney disease
industrial unrest	?industry unrest	student unrest
industrial psychologist	?industry psych.	school psychologist
rural policeman	country policeman	harbor policeman
subterranean explorer	underground explorer	jungle explorer

Let us take a sample pair like the NP electrical engineer made up of Adj + N, and the NP mining engineer, made up of N + N. My claim is that both the logical structure of these two NPs, and their derivations are precisely parallel, up to the point where certain compound-initial nouns are converted into derived surface adjectives. I must leave for another time an investigation of the derivational processes that produce these compound nominals, whether in N + N or Adj + N form. It seems clear, however, that they must involve an underlying proposition whose predicate and arguments get cut down and packaged up into a nominal compound (or in some cases, a genitive construction), usually with a certain amount of semantic material deleted. But the precise mechanism of the packaging process and the constraints on its deletions remain to be worked out in more satisfying detail.[3]

OK. So what decides that N + N compounds are OK in column 3, but are out in column 2? My claim is that compound-initial nouns, in English at least, are converted into adjectives in just those cases where an adjective is available in the English lexicon. Where no derived adjective exists, as is the case for mining, seagull, harbor, divorce, and the others in column 3, the surface morphology of the compound continues to reflect the two nouns it is ultimately derived from. Although this seems to imply that derivational processes, such as those that make adjectives from nouns, must involve some sort of lexicon-scanning procedure, there may well be a simpler explanation -- quite possibly on purely phonological grounds, like those that allow stony but not *bouldery, or oceanic but not *sea-ic.

Another important conditioning factor in English is whether the noun is of Romance or Germanic origin, since Romance seems to have provided us with a much richer set of derivational suffixes for making nouns into adjectives. If we look again at (4), we see that all the adjectives in column 1 have Romance stems and suffixes, except for bodily and the stem, Canada, in Canadian. On the other hand, the only nouns in column 2 that seem to withstand adjectivalization

are country and underground, which come to us from Middle English, rather than directly from Romance. [4]

In any case, it seems clear that the appearance of an adjectival suffix on the first noun in these compounds can be predicted on the basis of English derivational morphology, rather than on any more complicated syntactic or semantic grounds.

We must therefore now turn to the question of what evidence exists - beyond the suggestiveness of English morphology - to support the claim that these nonpredicate adjectives are derived from deeper nouns in the semantic structure. The sort of argument we would find most convincing would be an argument showing that these nonpredicate adjectives share syntactic behavior and semantic characteristics peculiar to nouns, which are therefore not manifested by verbs or true adjectives. I have so far found five such arguments, based on five distinguishing properties of nouns, which are listed below in (5). Let us look at these arguments one by one.

5. A. Nouns do not appear with very, quite, or other degree adverbials.
   B. Nouns conjoin only with other nouns.
   C. Nouns may appear after quantifiers.
   D. Nouns may be categorized by semantic features such as [± definite], [± concrete], [± animate], [± human] and [± common].
   E. Nouns enter into case relations such as agentive, objective, locative, dative/possessive, and instrumental.

Argument A claims that just as nouns do not appear with degree adverbials, neither do the nonpredicate adjectives we are presently considering. Relevant examples are given in (6).

6. Argument A: Nondegree-ness

Nonpredicate Adjs and Nouns:	Predicate Adjectives:
*very urban riots	very destructive riots
*very bodily harm	very extensive harm
*a very chemical engineer	a very inventive engineer
*a very digestive system	a very efficient system
*very riots	
*very harm	
*a very engineer	
*a very system	

Now Robert B. Lees observed in 1960 that "bona fide adjectives" could be systematically distinguished from "adjectives in compound nominals" (that is, my denominal nonpredicate adjectives) by the criterion of appearance with very: bona fide adjectives may be preceded by very, while adjectives in compound nominals may not. We thus seem to have

both a positive test for true adjectives and a negative test for "my kind."[5] However, note that my claim that nonpredicate adjectives are derived from underlying nouns predicts the syntactic irregularity observed - but not explained - by Lees and others. As is shown by the data in (6), nonpredicate adjectives behave with respect to very just like the nouns they come from, and not like true adjectives. Blood will tell.

Argument B uses conjunction as a test of syntactic constituency. It is well known that conjunction is allowed only between like constituents. However, many apparent exceptions to this rule, like those shown in (7), support the conclusion that the test of "like constituents" must be applied at the level of semantic structure, rather than at surface level.

7. a) I opened the door and guess who I saw! (Decl + Imper)
   b) One more step and you're dead! (NP + S)
   c) Give 'em an inch and they'll take a mile. (Imper + Decl)
   d) He left quietly and with dignity. (Adv + PP)
   e) She's a Baptist and how! (S + ?)
   f) *He left this world and no money. (NP + NP)
   g) *John excused and behaved himself. (VP + VP)
   h) *I studied linguistics in 1969 and Chicago. (N + N)

In accordance with this conclusion, my theory predicts that denominal nonpredicate adjectives should be a) conjoinable with relevant nouns, and b) not conjoinable with true adjectives that do not share their denominal origins. The data in (8) show that this is indeed the case. Nonpredicate adjectives conjoin both with nouns and with other denominal adjectives, but not with true adjectives derived from predicates via relative clause reduction.

8. Argument B: Conjunction of Like Constituents

Nonpredicate Adj + N:
- an electrical and mining engineer
- a corporate and divorce lawyer
- subterranean and jungle explorations
- electrical and water services

Nonpred Adj only with Nonpred Adj, not with True Adj:
- a civil and {mechanical / *rude} engineer
- an anthropological and {ethnographic / *respected} journal
- continental and {oceanic / *expensive} studies
- dramatic and {musical / *bitter} criticism

Argument C predicts that at least some nonpredicate adjectives should be quantifiable, like the nouns they are derived from, and unlike verbs and true adjectives. Since English morphology forbids

free quantifier morphemes to modify surface adjectives, we must limit our data to the bound morphemes of quantifying prefixes like mono-, bi-, multi-, and so forth. Consider the data in (9).

9. Argument C: Quantifiability

a)

Nouns:	Nonpred Adjs:	Pred Adjs:
monoplane	monochromatic	*monohigh
biped	binational	*bired
triangle	triconsonantal	*tristrong
quadrangle	quadrasonic	*quadralow
multinominal	multiracial	*multidense
polysyllable	polyphonic	*polynear
	omnidirectional	*omnistupid

b)

Nonpredicate Adjs:	Predicate Adjs:
chromatic analysis	monochromatic drawings
national exports	binational agreements
consonantal structure	triconsonantal roots
sonic barrier	quadrasonic recordings
racial tension	multiracial population
phonic distinctiveness	polyphonic music
directional signaling	omnidirectional transmitter

The examples in (9a) show that my theory is correct in predicting that these prefixes can be attached to both nouns and nonpredicate adjectives, but not to true adjectives. One unexpected result of this prefixation, however, is to remove the prefixed adjectives from the nonpredicate class, since it turns out that they can appear in predicate position when prefixed, as indicated in (9b). I have not yet figured out why this should be so.

Argument D predicts that denominal nonpredicate adjectives should share at least some of the semantic features by which nouns alone may be classified. Such features include [± definite], [± concrete], [± animate], [± human], and [± common]. All five of these can in fact be applied to nonpredicate adjectives; the classes formed are shown in (10).

10. Argument D: Semantic Features

+ definite: American, Parisian, Markovian, ...
- definite: national, urban, constitutional, feline, ...

+ concrete: aquatic, chemical, suburban, bodily, ...
- concrete: dramatic, constitutional, linguistic, ...

+ animate: senatorial, feline, presidential, Chomskyan, ...
- animate: rural, electric, acoustic, nervous, ...

+ human: Markovian, presidential, papal, athletic, ...
- human: Bostonian, civil, bovine, ethnographic, ...

+ common: financial, monthly, urban, musical, ...
- common: Persian, Chomskyan, Newtonian, Parisian, ...

As for nouns, so for nonpredicate adjectives, certain features make others redundant. So here too [+ human] implies [+ animate], and [- common] implies [+ definite]. It is easy to see that the selectional restrictions associated with these features for nouns carry over quite straightforwardly to nonpredicate adjectives. A few examples of parallel restrictions that can thus be predicted are given in (11); the reader can easily supply additional ones.

11. a) the refusal by the president/*chemicals
the presidential/*chemical refusal
b) digestion by cows/*Paris
bovine/*Parisian digestion
c) comment by an editor/*a cat
editorial/*feline comment
d) intuition of women/*Boston
feminine/*Bostonian intuition

Argument E predicts that nonpredicate adjectives should participate in the various case relations which are normally attributed only to nouns and noun phrases. Just as NPs in general have cases assigned not on the basis of surface configuration but rather on the basis of the underlying propositions from which they are derived, so too the case relations of nonpredicate adjectives must be analyzed in terms of the propositions from which they are derived. Keeping this in mind, we see in (12) examples of nonpredicate adjectives filling agentive, objective, locative, dative, and instrumental case functions within their respective compound NPs.

12. Argument E: Case Relations

Agentive:
presidential refusal
editorial comment
revisionist betrayals
senatorial investigations
national exports

Objective:
constitutional amendment
bodily harm
oceanic studies
vehicular regulations
dramatic criticism

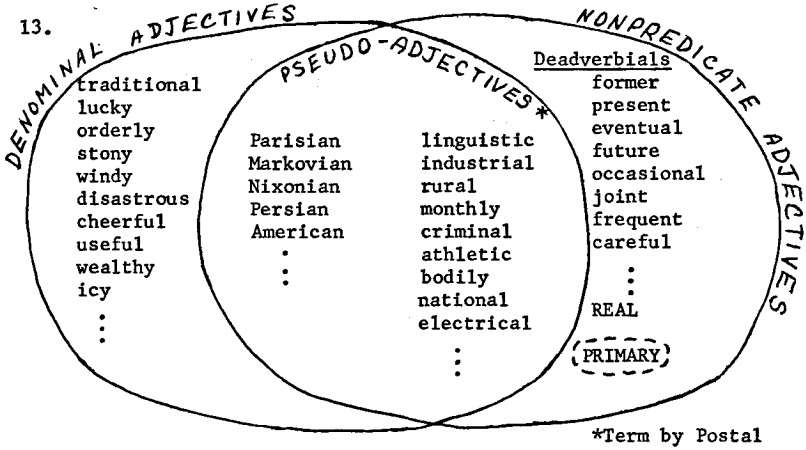
Locative:
marginal note
marine life
suburban crabgrass
urban transit
subterranean explorer

Dative/Possessive:
feminine intuition
feline agility
occupational hazard
judicial discretion
maternal conflicts
professional standards

Instrumental:
manual labor
microscopic analysis
solar generator
aural comprehension
electric calculator

In addition to the five arguments we have just examined, thirteen additional syntactic arguments have been advanced by Paul Postal in support of a denominal derivation of nonpredicate adjectives. Postal provides these arguments in an unpublished manuscript entitled, "The Derivation of English Pseudo-Adjectives" (1972), in which he defines "pseudo-adjectives" roughly as follows: "...pseudo-adjectives have NP ancestor constituents in the way preposed adjectives in general have full restrictive relative clauses as ancestors."[6] As can be seen in the diagram in (13) below,[7] Postal's pseudo-adjectives form a proper subset of what I have been calling nonpredicate adjectives, since my investigations have included both denominal and deadverbial adjectives. (I will discuss the deadverbials briefly in Section III below.) But since my denominal subset and Postal's entire set seem to be equivalent, the arguments that Postal presents for his pseudo-adjectives constitute relevant evidence that may be taken as further support for the denominal part of my theory.

13.



*Term by Postal

Postal's 13 arguments involve primarily anaphoric relations and constraints on NP deletions, with respect to all of which Postal shows that pseudo-adjectives behave just like the NPs from which he claims they are derived.[8] The point of his arguments is that an analysis of pseudo-adjectives not based on a denominal derivation would have to state these thirteen rules twice - once for all NPs, and then once again, with considerable loss of generality, for pseudo-adjectives.

The same point can - and should - be made for the five arguments I put forward earlier. A theory that does not derive these non-predicate adjectives from nouns could not predict those five areas of syntactic and semantic behavior that we have seen are shared by nouns and my adjectives. Moreover, such a theory would still be confronted by the problem of characterizing this set of anomalous adjectives in order to distinguish them from true adjectives.

Before moving on to deadverbial adjectives, let me point out one systematic ambiguity that shows up in many compound NPs. A typical example is provided in (14).

14. Nixonian policies =

a. 'Nixon's policies' (- pred)

Nixonian policies have made his second term even more offensive than the first.
*Those offensive policies are Nixonian (= Nixon's).

b. 'policies like Nixon's policies' (+ pred)

Mitchell's contempt for civil rights is positively Nixonian (= like Nixon's contempt).

In this example, we see that Nixonian policies is ambiguous between 'the policies of Nixon' and 'policies like the policies of Nixon'. When the NP is used in the first sense, the adjective may not appear in predicate position, as is shown in (14a). On the other hand, (14b) shows that when the NP is used in the second sense, such that the underlying semantic structure contains the predicate LIKE (or RESEMBLE, or whatever), then the adjective can not only be used in predicate position, but can even take degree adverbials. For example, we can say that someone's politics are very Nixonian, quite Nixonian, absolutely Nixonian, or even: more Nixonian than Nixon's.

This should not be surprising. It seems to me that the explanation is simply that the degree adverbial in such expressions, whether very or quite or a comparative, is modifying the higher predicate LIKE, rather than the lower argument Nixon. That LIKE regularly takes degree adverbials is indicated by the fact that we can say that X is very like Y, quite like Y, or slightly like Y, regardless of what Y is.

Additional examples of this systematic ambiguity in compounds are shown in 15 and 16.

15. feline agility =

a. 'agility of cats' (- pred)

It is feline agility that makes cats good mousers.
*The agility that makes good mousers is feline.

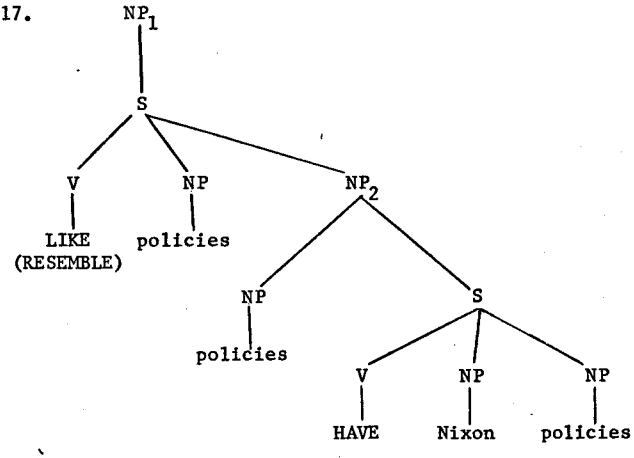
b. 'agility like the agility of cats' (+ pred)

The acrobat's agility was more feline than human!

16. Shakespearean language
Einsteinian theories
Parisian fashions
professional attitudes
Markovian solutions
scholarly efforts
feminist analyses
suburban lifestyle
fraternal embrace

The cause of this ambiguity lies in the freedom of deletion manifested in the compounding process, so that Nixonian policies is ambiguous on the surface between NP_1 and NP_2 in the rough tree shown in (17).

17.



It remains to be seen whether other ambiguities in addition to this quite common one can be systematically predicted for compound NPs. My hunch is that they can, and that a careful investigation of the case relations of the underlying propositions and the details of the lexical structures involved in compound NPs will allow us to substantially reduce the great idiosyncracies so often attributed to compound nominals.

III. Deadverbial and Other Nonpredicate Adjectives

Let me return now quite briefly to the nonpredicate adjectives listed in (3), which are reproduced along with some additional examples in (18).

18. a. a former husband
a previous employer
a present lover
a future commitment
an eventual loss

b. an occasional companion
a constant intrusion
a joint undertaking
a careful dinner

c. REAL: a true poet
a sheer fraud
a complete surprise
an utter fool
a regular champion
a total stranger
a perfect idiot
a real friend

d. PRIMARY: the main reason
a principal cause
the chief researcher
a prime suspect
the primary target
the first families (?)

I believe that the nonpredicate adjectives in (18a) and (18b), at least, can be shown to be derived from adverbs, although I shall not provide the evidence in this paper. Once this is demonstrated, I would recommend replacing my utilitarian term of "nonpredicate adjectives" (which really just describes one syntactic symptom, so to speak) with Postal's more elegant term of "pseudo-adjectives" to describe all those adjectives not derived via relative clause reduction, with the one stipulation that the class of pseudo-adjectives be recognized as having at least two subclasses: denominal pseudo-adjectives, and deadverbial pseudo-adjectives.

The nonpredicate adjectives in (18c) and (18d) seem to reduce to the two basic semantic ideas shown in caps, that is, REAL and PRIMARY, respectively. It may well be that the REAL-type adjectives are also deadverbial, such that Sam is a real poet would come from a semantic structure somewhat like this one: REAL [Poet (Sam)], where REAL, like other adverbs, is represented as a higher predicate with a single sentential argument. However, I have no idea at this time what determines the lexical idiosyncracies of the various members of this set.

As for the PRIMARY group, suggestions for its possible derivation would be welcome, since I have no idea.

IV. Conclusion and Remaining Questions

The standard transformational derivation of preposed adjectives from reduced relative clauses may well be the most satisfactory explanation to date for "true adjectives" in English. However, we have seen that several large classes of surface adjectives in English must have quite different transformational histories. We have suggested that one large class of nonpredicate adjectives must be derived from nouns, and that the NPs in which these adjectives appear must have a derivation that parallels that of N + N compound noun phrases. Different derivations remain to be worked out for deadverbial nonpredicate adjectives, as well as for denominals that do not really form compound NPs.

Many prickly questions remain unresolved, including these:

1) Although the adjectives in an electrical engineer and the American refusal are both nonpredicate and denominal, the first NP is a compound in a way that the second is not. How may this difference be formally characterized? predicted? constrained?
2) Can the semantic material deleted in compound-NP formation be predicted (and hence recovered) from the semantic structure of the head noun in the surface compound? How much can such predictions reduce the alleged idiosyncracies of compound NPs?
3) There is an implied "permanence of association" incorporated into the meaning of compound NPs which is absent from uncompounded paraphrases. To take but one example, someone who explores subterranean caves on Saturdays only for the fun of it would probably not be described as "a subterranean explorer." How may this "permanence of association" be formally characterized, so that compounding processes would be sensitive to its presence, and blocked in its absence? (For related discussion, see Bolinger 1967.)
4) The following are exceptions to the generalization represented by the table in (4) above:

*pictorial book	picture book (cf. pictorial atlas)
*oceanic voyage	ocean voyage (cf. transoceanic v.)
*ocular infection	eye infection
*paternal figure	father figure
*bloody poisoning	blood poisoning
*mountainous tribes	mountain tribes

How can we explain these and other exceptions, beyond stylistic differentiation?

5) Can the order of multiple nonpredicate adjectives be predicted, as in a former presidential advisor, Chinese civil engineering or professional subterranean explorations?

FOOTNOTES

1. At this point I must acknowledge my debt to Dwight Bolinger, whose intriguing and insightful article, "Adjectives in English: Attribution and Predication," provided both delightful data and needed inspiration for my present research.

2. Although a few of the compound-initial nouns in this column do have derived adjectives, e.g., cerebral for brain, or renal for kidney, these belong to a more technical level of speech than that of "normal" conversation. Use of these adjectives would then be marked stylistically as "technical" or "learned."

3. In this vast and puzzling area of compound formation, the works of Gruber (1965, 1967), Lees (1960), Ljung (1970), and Postal (1972) offer particularly illuminating insights for other explorers of this still murky territory.

4. The comparative richness of these derivational processes in Romance as opposed to Germanic (or at least in French as opposed to German) is further illustrated in the following examples.

a)	municipal office	vs.	Stadtamt
	urban district		Stadtkreis
	civic rights		Stadtrecht
	local letter		Stadtbrief
b)	student politics	vs.	la politique estudiantine
	tear gas		le gaz lacrymogène
	a family reunion		une réunion familiale

Note that along a continuum of derivational productivity with respect to formation of denominal adjectives, English lies between German and French, with German showing a clear preference for (or massive restriction to) preserving both nouns of the compound in its surface morphology, while French can continue to adjectivalize its compound-final nouns long after English derivational resources have, so to speak, been exhausted.

5. See Lees (1960), pp. 180-1. In fact, I believe there is an important implicit claim here that all true adjectives are adjectives of degree, a claim which looks very promising to me and which I would like to investigate further at another time. Such a claim would involve demonstrating that surface adjectives like pregnant (in its fundamental sense, not the derived sense of 'appearing to be pregnant, hence, large-bellied') whose semantic structure (roughly: CARRY CHILD) allows no quantification by degrees can and should be systematically distinguished from "true adjectives" like big, smart, old, or dense, whose semantic structure must be such as to allow predication of degrees along a continuum.

6. This rough definition is taken from the Introduction (p. 1), where Postal recapitulates the arguments presented in Postal 1969 for the derivation of Proper Pseudo-Adjectives from underlying NPs. Later on in the 1972 manuscript, Postal refines his definition of pseudo-adjectives in terms of the derivational process he is therein proposing for pseudo-adjectives. For purposes of comparison with my nonpredicate class, however, the first definition given will suffice.

7. Note that classification of many of the adjectives in the overlapping area of (13) depends on the head nouns with which they appear. Compare:

nonpredicate use	predicable use
nervous system	nervous manner
subterranean explorer	subterranean caves
heavy smoker	heavy table
Swiss tidiness	Swiss cheese
American defeats	American cities
Einsteinian legacy	Einsteinian theories
Shakespearean imitators	Shakespearean language
Nixonian appointments	Nixonian politics

Note also that Nixonian appointments in the first column and the last three examples in the second column are ambiguous between a nonpredicate and a predicate use. This ambiguity will be discussed more fully below.

8. See Postal 1972, Part II.

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