

# Tutorial: The Structure & Projection of DP

Richard Larson (Stony Brook University)

In this tutorial I consider the structure of nominals from the standpoint of two independent, but roughly contemporaneous developments in linguistic theory:

- **Generalized Quantifier Theory** in semantics (Barwise and Cooper 1981, Keenan and Stavi 1983, among many others)
- **DP Hypothesis** in syntax (Abney 1987, Fukui and Speas 1986, Szabolcsi 1983)

Both were enormously influential:

GQT ⇒ quantifier types, cross-linguistic universals in D semantics, quantification outside the determiner system, indefinites & donkey anaphora  
 DPH ⇒ syntax of nominals, nature of functional categories, cartography

My own interests:

- Biographical. I was Cooper’s PhD student; Abney was my PhD student. I had a front row seat at these developments.
- Conceptual. GQT and DPH remain unintegrated lines of research; DPH views D as a **functional element** analogous to T; GQT views D as a **predicate** with arg structure analogous to V. The consequences for projection are substantial.

Game plan:

- Briefly review the development of the “DP as Functional Cat” view.
- Introduce Generalized Quantifier Theory
- Introduce an alternative picture on which D projects analogously to V.

## 1.0 Development of the DPH

### 1.1 Early Approaches: The Primacy of S

The earliest era of generative grammar (Lees 1960, Chomsky 1964, Fraser 1970, Newmeyer 1970) noted systematic connections between clauses & nominals. (1a,b) exhibit similar **grammatical/predicational relations**: it’s natural to describe *the teacher* in both as the subject of which *criticize/criticism* is predicated. *The student* likewise seems an object/complement of *criticize/criticism* in both.

- (1) a. The teacher criticized the student.  
 b. The teacher’s criticism of the student (was unjustified.)

**Selectional relations** also appear to match; (2a,b) seem anomalous for the same reasons.

- (2) a. #The elephant severely criticized the stone.  
 b. #The elephant’s criticism of the stone (was severe.)

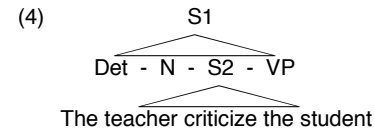
**Transformational relations** also seem relevant in the description of both. (3a,b) were taken to be related by Passive. (3b,c) appear similarly related.

- (3) a. Mary rejected John.  
 b. John was rejected by Mary.  
 c. Mary’s rejection of John (was painful.)  
 d. John’s rejection by Mary (was painful.)

In early generative grammar:

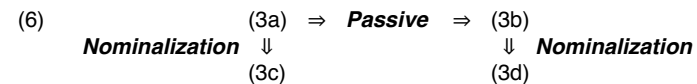
- **Sentences** are the unique domain where grammatical/predicational/selectional relations are expressed
- **Sentences** are the unique domain of transforms (i.e., they apply only to Ss)
- All systematic relationships are to be captured by transformational rules.

These assumptions virtually mandate a **Nominalization Transform** deriving (1b) from (1a), e.g., from (4) through a rule acting as in (5):



- (5) **Nominalization**
- a. raise the subject of S2 (*the teacher*) to Det, inserting ‘s
  - b. insert *-ism*, converting V (*criticize*) to N (*criticism*).
  - c. adjoin *of* to the object
  - d. raise embedded VP (*criticism of the student*) to N, recategorizing it.

Grammatical, predicational and selectional relations in nominals would be inherited from their sentential sources. Transformational relatedness is captured via timing wrt Nominalization (6):



**1.2 Problems with Nominalization**

Nominalization raised many questions. While some passive Ss nominalize, others don't (cf. 4a-d). While some passive-like nominalizations have clear S sources (3d), others don't (5a,b). While some transformationally derived Ss (e.g., passives) have nominalizations, others (e.g., Raising to Object Ss) don't (6a-d). Why??

- (4) a. Many people know Ringo Starr  
 b. Ringo Starr is known by many people  
 c. Many people's knowledge of Ringo Starr (is extensive.)  
 d. \*Ringo Starr's knowledge by many people (is extensive.)
- (5) a. The criticism of the student by the teacher (was unjustified.)  
 b. The defeat of Carthage by Rome (consolidated its position.)
- (6) a. John believes that space is infinite.  
 b. John believes space to be infinite.  
 c. John's belief that space is infinite (is surprising).  
 d. \*John's belief of space to be infinite (is surprising).

Nominalization must also be constrained in various ways, e.g., to exclude modals/aspectual Vs (7a), negations (7b), and -ly adverbs (7c). Why?

- (7) a. The enemy's **\*will/have** destruction of the city  
 b. The enemy's **\*not** destruction of the city  
 c. The enemy's **\*certainly** destruction of the city

Nominalization requires hypothetical verbal sources where no occurring lexical forms exist (8)/(9). Hmmm....

(8)	<b>Verbs</b> a. transgress progress *aggress b. criticize exorcise *witticize	<b>Nouns</b> transgression progression aggression criticism exorcism witticism	"Action nominalizations"
(9)	<b>Verbs</b> support *benefact rule *king	<b>Nouns</b> supporters benefactors ruler king	"Agent nominalizations"

**1.3 Remarks on Nominalization: Generalizing Predication/Selection/Rules**

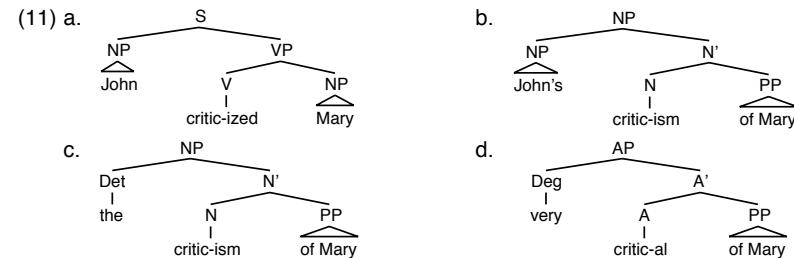
Chomsky (1970) reanalyzed the whole area of nominalizations, proposing a (breath-taking!) three-fold generalization:

- a generalization of predicational/grammatical relations in syntax
- a generalization of the notion of selectional structure in the lexicon
- a generalization of transformational rules

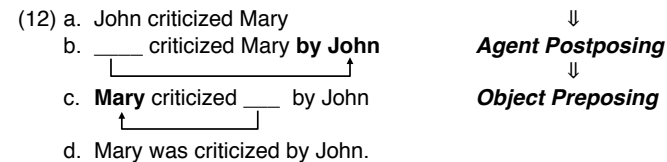
**Proposal 1.** Predicational/grammatical relations are not the domain of a single expression type (S), hence their presence is not diagnostic for transformational derivation from S. Predicational/grammatical relations can be captured in terms of an abstract structural template: "X-bar theory" (10).

- (10) a. X" → Spec X'
- b. X' → X Comp

**Proposal 2.** Roots underlying Vs and nominalizations are "category neutral". E.g., there is a single root *critic-*, with a single set of semantic selectional features, and disjunctive category features ([+n] v [+v]). This allows four mutually underived projections (11a-d):



**Proposal 3.** Classical grammatical transforms like Passive are not unitary; they can be decomposed into "sub-operations":



Transforms should apply freely to any structure meeting their structural description.





Pronouns correspond to **intransitive Ds** (Postal 1970):

- (32) a. He<sub>n</sub> swims  
           ↓  
       HE<sub>n</sub> ( X )
- b. Mary laughed  
           ↓  
       LAUGH( x )

**2.1.2 θ-roles in D**

The set arguments of D play different roles in quantification. Cf. (33a,b). Logical formulae (33c) represent NP & VP contributions symmetrically, but there's a clear difference. The NP gives the domain of quantification – the **restriction**, whereas VP says what's true of the domain – the **scope** (cf. 34)

- (33) a. Some [man] [runs].  
       b. Some [runner] [is a man].  
       c.  $\exists x[\text{man}(x) \ \& \ \text{runs}(x)] = \exists x[\text{runs}(x) \ \& \ \text{man}(x)]$

- (34) a. Some [men] [are bachelors].  
       b. Some [bachelors] [are men].

Restriction and scope can be thought of as **θ-roles** -  $\theta_{\text{SCOPE}}$   $\theta_{\text{RESTR}}$  - assigned by D

(35a). With ditransitives, there is a third "oblique" role ( $\theta_{\text{NOBL}}$ ) assigned to complements of *than/as/except* (35b).

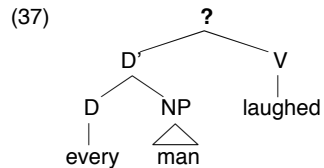
- (35) a.  $\theta_{\text{SCOPE}} \ \theta_{\text{RESTR}}$  EVERY( X , Y )       $\theta_{\text{AGENT}} \ \theta_{\text{THEME}}$  KISS( X , Y )  
       b.  $\theta_{\text{SCOPE}} \ \theta_{\text{RESTR}} \ \theta_{\text{NOBL}}$  MORE-THAN( X , Y , Z )       $\theta_{\text{AGENT}} \ \theta_{\text{THEME}} \ \theta_{\text{GOAL}}$  GIVE( X , Y , Z )

**2.2 Projecting DP**

**2.2.1 A Selectional Paradox?**

Selecting heads are assumed to project their category. If so, RVD seems to induce paradox in simple Ss like (36). What is the category label "?" in (37):

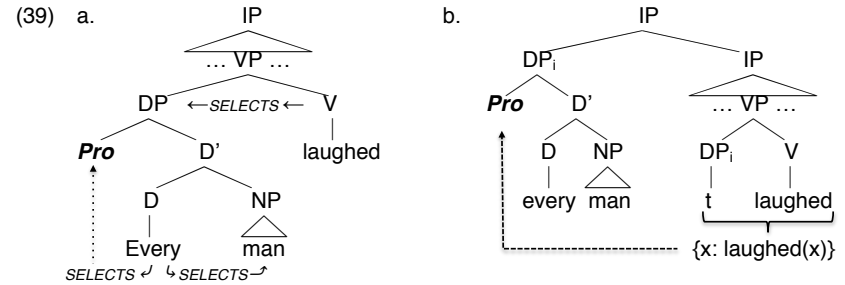
- (36) Every man laughed.



Under standard views, V (or v) selects its subject *every man*. Hence ? = VP  
 Under RVD, D selects *man* and *laughed*. Hence ? = DP

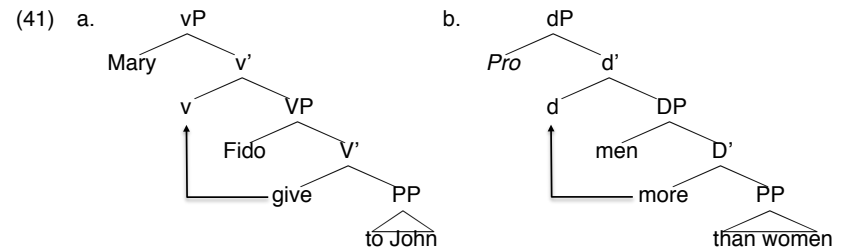
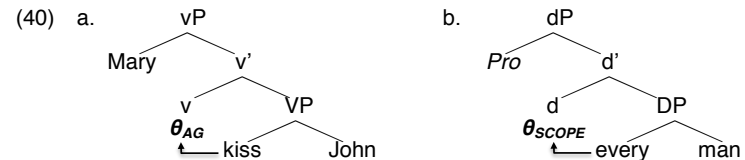
- (38) a. John persuaded **Mary** to attend.  
       Mary = obj of *persuade* AND subj of *attend*  
       b. John persuaded Mary [**PRO** to attend].  
           ↑

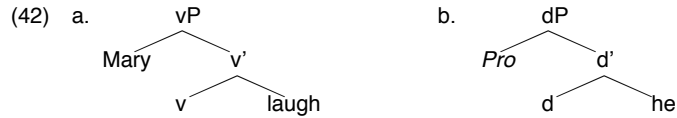
**Proposal:** D never selects its scope arg directly. DP contains an internal subject *Pro*, whose value is given by the predicate to which DP adjoins at LF:



**2.2.2 Projecting Transitive, Ditransitive and Intransitive DPs**

With this much in place, Ds can be projected in exact parallel with verbs (see Larson forthcoming).

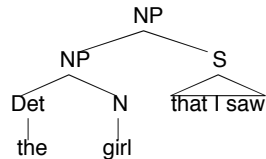




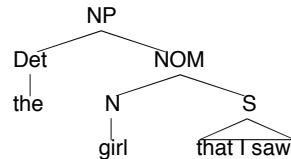
2.2.3 Projecting Modifiers

The DP and VP analogy suggests a way of reviving some old (but still appealing!) views about the attachment of modifiers.

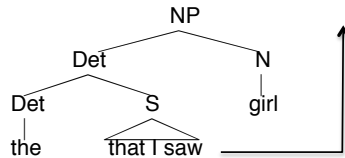
(43) a. **The NP-S Analysis**  
Ross (1967)



b. **The NOM-S Analysis**  
Stockwell, Schacter & Partee (1970)



c. **The ARTICLE-S Analysis** Smith (1964)

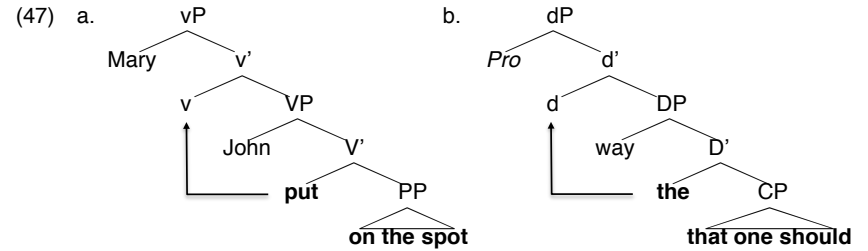


Article-S was motivated in part by apparent discontinuous dependencies between D and restrictive modifiers, including RCs:

- (44) a. I earned it that way  
 b. \*the way  
 c. the old-fashioned way  
 d. the way that one should  
 (after Kuroda 1968)

- (45) a. \*the Paris  
 b. the old Paris  
 c. the Paris that I love  
 (from Jackendoff 1977)

- (46) a. [vP **treat** John **with kid gloves**] ("treat carefully") MANNER  
 b. [vP **rub** John **the wrong way**] ("bother") MANNER  
 c. [vP **put** John **on the spot**] ("confront") LOCATION  
 d. [vP **kill** John **with kindness**] ("be very solicitous toward") INSTRUMENT



(48) All **students that voted for John** and **faculty that voted for Mary**.

[<sub>dP</sub> all [<sub>dP</sub> [<sub>dP</sub> students [<sub>D'</sub> t [<sub>CP</sub> that voted for John ]]] and [<sub>dP</sub> faculty [<sub>D'</sub> t [<sub>CP</sub> that voted for Mary ]]]]

(49) a. Max met **Bill yesterday** and **Sue Tuesday**.

b. [<sub>v'</sub> met [<sub>VP</sub> [<sub>VP</sub> Bill [<sub>v'</sub> t [<sub>DP</sub> yesterday ]]] and [<sub>VP</sub> Sue [<sub>v'</sub> t [<sub>DP</sub> Tuesday ]]]]

(50) **All students** and **many faculty** who voted for John.

[<sub>dP</sub> [<sub>dP</sub> Pro [<sub>d'</sub> All [<sub>DP</sub> students [<sub>D'</sub> t t ]]] and [<sub>dP</sub> Pro [<sub>d'</sub> many [<sub>DP</sub> faculty [<sub>D'</sub> t t ]]]] [<sub>CP</sub> who voted for John ]

This view can be extended to other postnominal PPs & APs (51)-(52).

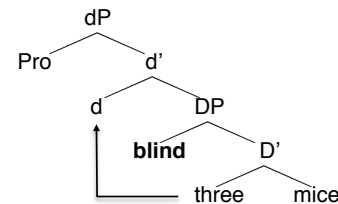
- (51) a. the man [**pp at the podium**] [**pp in a grey suit**]  
 b. three women [**AP present**] [**AP capable of lifting a sofa**]  
 c. every book [**pp on the shelf**] [**AP published since 1965**]

(52) [<sub>dP</sub> Pro [<sub>d'</sub> every [<sub>DP</sub> book [<sub>D'</sub> t [<sub>DP</sub> [**pp on the shelf**] [<sub>D'</sub> t [**AP published since 1965** ]]]]]]

What about prenominal APs??

- (53) a. Three **blind** mice (cf. *three mice that are blind*)  
 b. The **tall** woman (cf. *the woman who is tall*)  
 c. Every **beautiful** house (cf. *every house that is beautiful*)

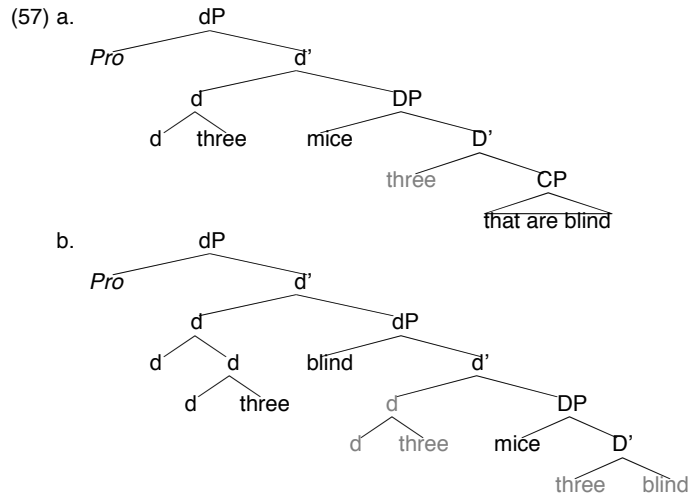
(54) **Base Generation??**



(55)  $\theta_{SCOPE} > \theta_x > \theta_{RESTRICT}$

- (56) a. three **German** mice
- b. three **blind German** mice
- c. three **grey blind German** mice
- d. three **furry grey blind German** mice
- e. three **small furry grey blind German** mice
- f. three **excellent small furry grey blind German** mice

**Proposal:** Resurrect the idea that attributive APs originate in the position of RCs, and achieve their surface position by movement:



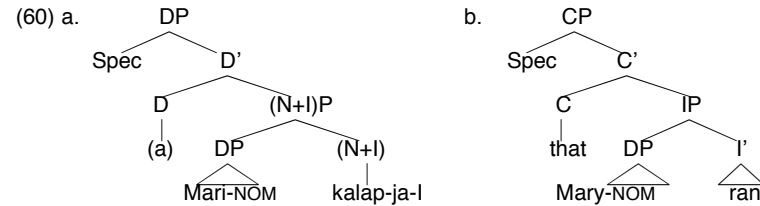
### 3.0 Genitives and Nominalizations

The postulation of a *Pro* subject in DPs has strong consequences for the analysis of prenominal genitives, including nominalizations (58a-d):

- (58) a. John's briefcase
- c. John's grandmother
- d. John's completion of the plan

Recall Abney (1987) assimilates genitive DPs to clauses (IPs), with the possessor a subject. Szabolsci (1983) extends the analogy with Hungarian examples like (59), where possessor & definite article co-occur. S views the latter as C-like (60a,b):

(59) (a) Mari kalap-ja-i  
 (the) Mari hat-POSS-PL-2SG  
 'Mari's hats'



The analysis developed here does not support the sentential view:

- The highest arg in DP - its thematic "subject" - is the scope arg *Pro*.
- Possessors can't be structurally parallel to subjects
- Hungarian definite D cannot be parallel to C.

In place of the sentential picture, a very different correspondence suggests itself.

### 3.1 Possessive Ds as Triadic Predicates

Suppose Hungarian shows the "true shape" of genitive DPs, where the head is a definite D, and the genitive-marked possessor occurs below D.

(61) [<sub>DP</sub> *Pro* d [<sub>DP</sub> Mary's [<sub>D</sub> THE hats ]]]

Then genitive DPs are triadic; the two lower args standing in a possessive relation. What is this parallel to in VP? Double objects (DOs)!

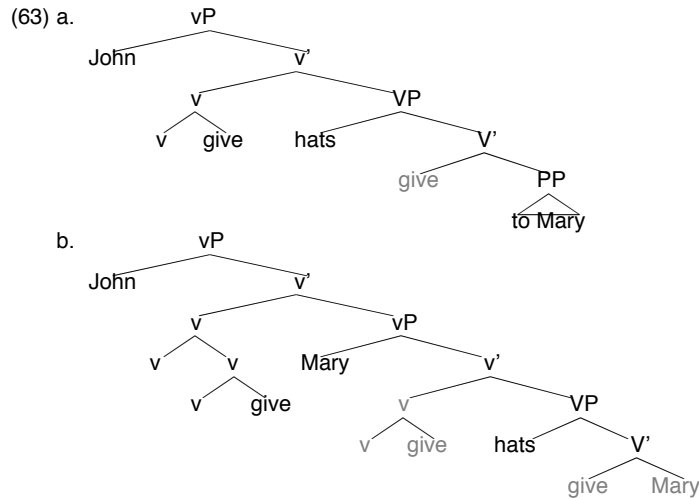
(62) [<sub>VP</sub> John v [<sub>VP</sub> Mary [<sub>V</sub> gave hats ]]]

**Proposal:** Genitive nominals aren't clause-like, with poss analogous to subj & definite D parallel to C. Rather they are **VP-like**, with poss analogous to indirect obj & D parallel to V.

More simply: genitive nominals are the DP-equivalent of DO constructions.

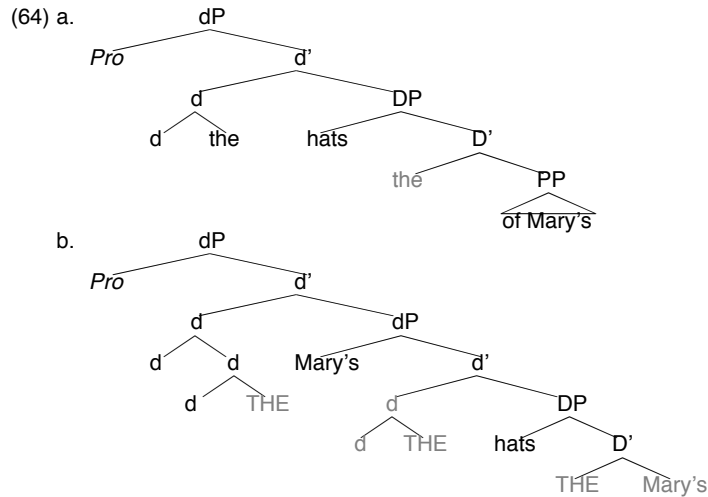
#### 3.1.1 PP Datives and "Applicative Shift" in VP

In Larson (forthcoming), oblique datives have a direct V-raising derivation (63a) whereas, DO constructions involve "Applicative Shift" (63a,b).



**3.1.2 Prepositional Genitives and "Genitive Shift" in DP**

Larson (forthcoming) extends this analysis to genitives. PP genitives get a direct D-raising derivation (64a,b). Prenominal genitives involve "Applicative Shift" (64a,b).



**3.2 Consequences**

This analysis claims:

- prenominal genitives always achieve their surface position by movement
- the possessor always originates as a D-complement.

**3.2.1 Non-Thematic Genitives**

In non-thematic genitives, there is no  $\theta$ -relation between N (*hats, arm, afternoon*) & poss (51a-c);

- (65) a. Mary's hats (are on the veranda)  
 b. Mary's arm (is tanned)  
 c. Jill's afternoon (was hectic).

- (66) a. [<sub>DP</sub> the hats of Mary's ]  
 b. [<sub>DP</sub> THE **Mary's** hats \_\_\_\_ ]

Movement of non-thematic prenominal genitives is not new. Ross (1967, 1981), Chomsky (1970), Stockwell, Schacter and Partee (1973), and McCawley (1988) all propose analyses with the equivalent of (67) at some derivational stage.

- (67) McCawley (1988)  
 a. the briefcase [**which is John's**]  
 b. the briefcase [**John's**] (from (67a) by Relative Clause Reduction)  
 c.i. the briefcase [**of John's**] (from (67b) by of-insertion)  
 ii. **John's** briefcase \_\_\_\_ (from (67b) by fronting DP's)

On the analysis offered here, prenominal genitives don't derive from RCs, but project into the same initial position.

Interesting sidelight. Many languages show formal similarities between RCs and genitives. Dixon (1966) observes Dyirbal RC morphology also occurs in genitives (cf. 68a,b).

- (68) a. yibi yara-ngu njalnga-ngu djilwa -nu -ru bura-n  
 woman-NOM man-ERG child-ERG kick -REL -ERG see-TNS  
 'The man who had been kicked by the child saw the woman'  
 b. njalnga guda-ngu yara -nundjin-du badja-n  
 child-NOM dog-ERG man -REL-ERG bite-TNS  
 'The man's dog bit the child'



### 3.2.2 Thematic Genitives

"Applicative shift" appears problematic for cases like (69)-(70). In (69) *John* seems to receive  $\theta_{AGENT}$  from N. In (70) *John* seems to receive  $\theta_{THEME}$  from N (on one reading). This is exactly what motivates the clausal analogy (71b)/(72b).

- |                                                                                 |                                                                |
|---------------------------------------------------------------------------------|----------------------------------------------------------------|
| (69) a. John's examination of the plan<br>(cf. <i>John examined the plan.</i> ) | (70) a. John's election<br>(cf. <i>They elected John.</i> )    |
| b. John's selection of the winner<br>(cf. <i>John selected the winner.</i> )    | b. John's grandmother<br>(cf. <i>The grandmother of John</i> ) |
|                                                                                 | c. John's picture<br>(cf. <i>A picture of John</i> )           |

- (71) a. [John's selection of the winner]  
b. [John selected the winner]

- (72) a. [ the election of **John** ]  
b. [ **John's** election ]  
c. John was elected .
- 

On the current analysis, apparent  $\theta$ -marking by N must be illusory.

### 3.2.3 The Semantics of Genitives (Burton 1995)

Burton's (1995) semantic analysis of genitives underwrites this conclusion. Burton proposes possessives contain a free variable R over relations (cf. Partee 1987, Higginbotham 1983, a.o.). In non-thematic genitives (73a), R is fixed deictically (73b).

- (73) a. John's briefcase  
b. [the x: briefcase (x) & R(x,John)]

Thematic genitives (74a) are ambiguous. There is a (nonfavored) non-thematic reading where R is fixed deictically (74b), and a (favored) thematic reading where R is given by N (740c).

- (74) a. John's wife  
b. [the x:  $\exists y$ [wife(x,y) & R(x,John)]  
c. [the x; wife(x,John)]

Burton's proposes: the semantic structure of *John's N* is uniformly (75a); thematic readings occur by taking N as the antecedent of R (75b).

- (75) a. [the x: N(x) & R(x,John)]  
b. [the x:  $\exists y$ [wife(x,y) & R(x,John)]  
antecedes
- 

Consequence: in thematic genitives, **the possessor is never a direct argument of N**. Instead it's an argument of the R-variable in D, which gets its value through N.

This proposal appears to work for all thematic nominals and for nominalizations!

- (62) a. Nero's destruction of Rome  
b. [the e:  $\exists x$  [ **destruction**(e) & Ag(e,x) & Th(e,Rome) ] & R(e,Nero)]  
antecedes  
c. [the e:  $\exists x$  [ **destruction**(e) & Ag(e,x) & Th(e,Rome) ] & Ag(e,Nero)]  
d. [the e: **destruction**(e) & Ag(e,Nero) & Th(e,Rome)]
- 

If Burton is correct, the second main implication of the Applicative Shift account of possessors appears sustainable.

## 4.0 Recap & Summary

- Systematic relations between nominal and clauses have been a core theme in linguistic theorizing since early days.
- In 70s, these relations expanded of our views of grammatical, predicational, selectional and transformational relatedness from S/V to the wider domain of of lexical categories (V, N, A, P)
- X-bar became a template for arg-structure syntax
- In 80s, increasing importance of non-lexical categories for clause structure raised the question of their projection; does X-bar theory fit them too?
- Chomsky (1986): Yes!
- Is their syntax related to arg-structure?
- Abney (1987): No! Non-lexical/functional categories are without arg structure; their projection must be understood in different terms.
- This line of thinking lead to: extended projections, hierarchy of functional projections, cartography.
- BUT: there was a different route to pursue: GQT and the RVD.
- The latter yield a picture of syntactic projection/composition for quantificational elements fundamentally parallel to that of verbal elements, with independent notions of valence and  $\theta$ -role.
- Parallels notions of transitive, ditransitive and intransitive constructions.
- Parallels notions of modifier syntax.
- Parallels notions of voice alternation (Applicative Shift).

- This analysis (if correct) reveals some resemblances to be illusory: IP vs. DP “subjects”. The latter are, in fact, more closely related to indirect objs.
- The analysis of genitives here appears to fit a very plausible semantics (Burton 1995)
- These results are by no means limited to determiners. They can be extended to **all quantificational elements** – to all cats expressing relations between set args (e.g., Deg, Meas).
- It thus appears possible to return a great collection of functional categories to the domain where standard arg-structure based notions of projection apply.

## Thank you!

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