

## The Projection of DP

Richard Larson (Stony Brook University)

Main Points:

- Significant aspects of syntactic structure (merge) are held to derive from argument structure ( $\Theta$ -roles, valency, selection)
- The fundamental notions of argument structure are uniformly verb-derived (e.g.,  $\Theta_{AGENT}$ ,  $\Theta_{THEME}$ ,  $\Theta_{GOAL}$ )
- Research in quantification theory has yielded a genuinely independent characterization of argument structure for determiners (D).
- This allows us to extend familiar ideas of structure projection to DP.
- The resulting picture is one in which DP is much more analogous to VP than to TP or CP (by far the most common view)

### 1.0 The Content of Determiners

- (1) a. The enemy's destruction of the city      c. The man that I met  
 b. Every flower                                      d. John's book
- (2) a. Some men arrived.  
 b. All whales are mammals.
- (3) a.  $\exists x[ \text{man}(x) \wedge \text{arrive}(x) ]$   
 b.  $\forall x[ \text{whale}(x) \rightarrow \text{mammal}(x) ]$
- (4) a. Most people think that dinosaurs were cold-blooded.  
 b. Few cats reject tuna fish.

### 1.1 The Relational View of Determiners (RVD)

- (5) **RVD**: Determiners express relations between predicates (Frege 1953).
- (6) a. All whales are mammals.  
 b.  $\text{ALL}(\{x: x \text{ is a mammal}\}, \{x: x \text{ is a whale}\})$
- (7) a. Some whales are mammals.  
 b.  $\text{SOME}(\{x: x \text{ is a mammal}\}, \{x: x \text{ is a whale}\})$
- (8) a.  $\text{ALL}(X,Y) \text{ iff } |Y - X| = 0$   
 b.  $\text{SOME}(X,Y) \text{ iff } |Y \cap X| > 0$
- (9) a.  $\text{NO}(X,Y) \text{ iff } |Y \cap X| = 0$   
 b.  $\text{MOST}(X,Y) \text{ iff } |Y \cap X| > |Y - X|$   
 c.  $\text{THE}(X,Y) \text{ iff } |Y - X| = 0 \ \& \ |Y| = 1$

## 2.0 Implications for Nominal Syntax

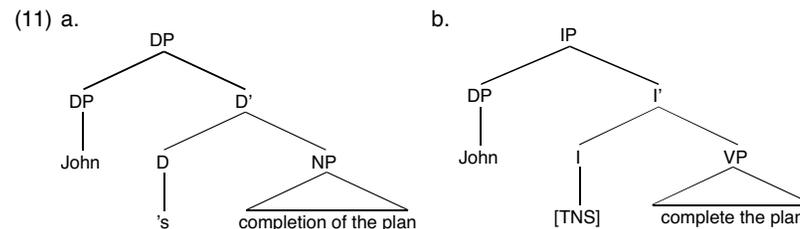
### 2.1 D as a Head

RVD appears more compatible with the DP theory of Abney (1987) (10a) than with traditional view (10b). The assimilation is not straightforward however.



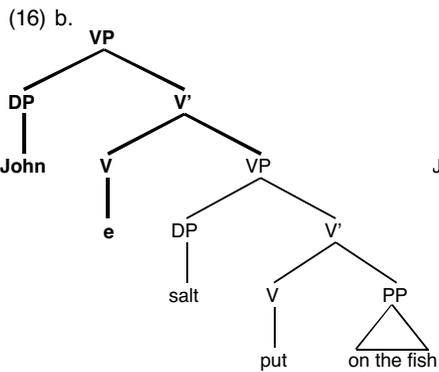
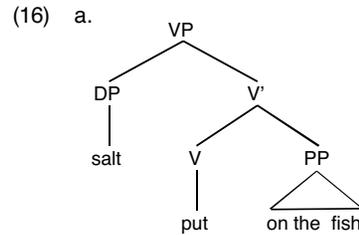
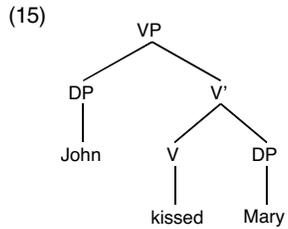
**A.** Abney analogizes D in DP to the functional category I in IP. But semantically, D appears more similar to a dyadic predicate.

**B.** Under RVD, D has an external argument (X) corresponding to the verbal predicate. This is not reflected in a structure like (11a) proposed by Abney on analogy with (11b).

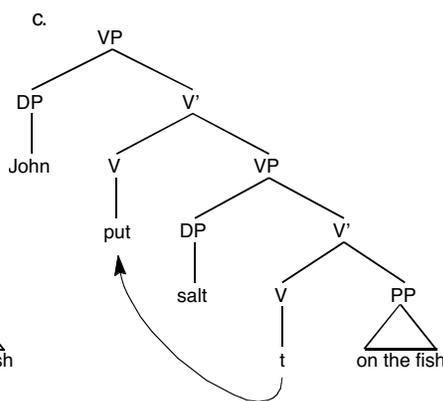


### 2.2 "Shell Theory" (Larson 1988, 1989,1990,1991)

- (12) a.  $XP \rightarrow YP \ X'$   
 b.  $X' \rightarrow X \ ZP$  ("Single Complement Hypothesis")
- (13) **Locality**: If  $\alpha$  is an argument of  $\beta$ , then  $\alpha$  must be realized within a projection of  $\beta$ .
- (14) **Hierarchy**: Roles determined by a predicate are projected according to the thematic hierarchy  $\text{AGENT} > \text{THEME} > \text{GOAL} > \text{OBLIQUE}$  such that if  $\theta_1 > \theta_2$ , then the argument to which  $\theta_1$  is assigned c-commands the argument to which  $\theta_2$  is assigned.



VP-Shell Projection

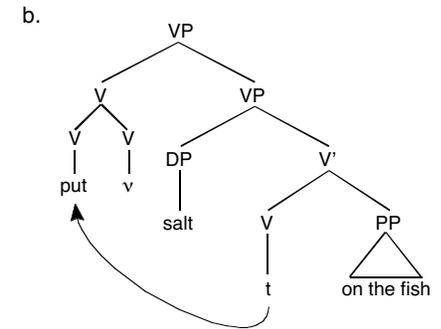
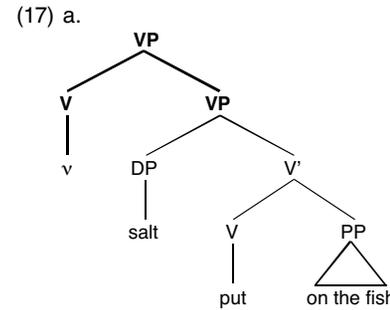


V-Raising

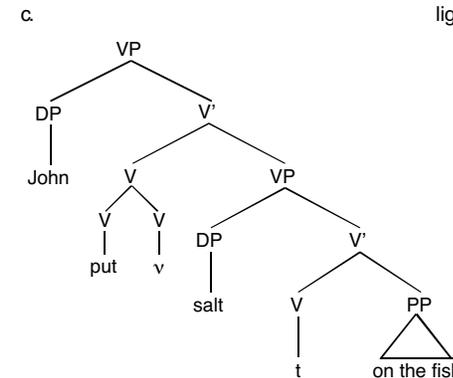
**Problem:** Chomsky (1994) eliminates X-bar theory; hence template rules like (12a,b) are no longer available to force projection of VP shells with empty heads. Can we still derive structures of this kind, or are they untenable?

**Proposals:** (a) Multiple specifiers are forbidden (Kayne 1993)  
 (b) English contains a light verb *v* (Chomsky 1995).

**Definition:** A light verb has no thematic roles, but can absorb those of an adjoined head (essentially, Grimshaw and Mester 1988; see also Saito and Hoshi 1998)



light verb *v* absorbs  $\Theta_{AGENT}$  of *put*



## 2.3 Projecting DP Shells

### 2.3.1 A Thematic Hierarchy for DP

**Proposal:** There is a hierarchy of  $\Theta$ -roles in D that is parallel to, but distinct from, the hierarchy of  $\Theta$ -roles in V

- V:**  $\Theta_{AGENT} > \Theta_{THEME} > \Theta_{GOAL} > \Theta_{OBLIQUE}$   
**D:**  $\Theta_{SCOPE} > \Theta_{RESTRICT} > \Theta_{NOBLIQUE}$

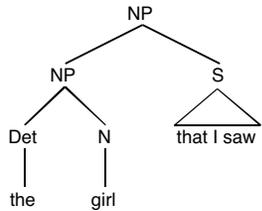
The principles of Locality and Hierarchy remain the same.



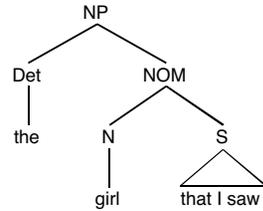
### 4.0 The Syntax of Relative Clauses

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

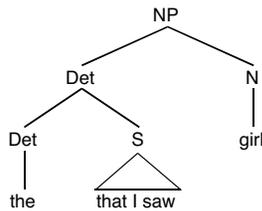
(26) a. **The NP-S Analysis**  
Ross (1967)



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



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



d. **A "Right Wrap" Variant** (MG)



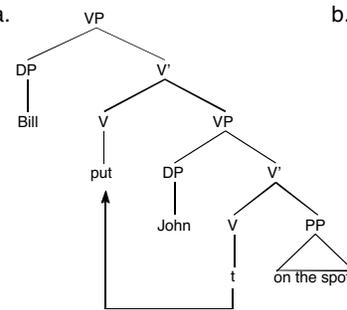
Article-S was motivated in part by apparent discontinuous dependencies holding between determiners and restrictive modifiers, including relative clauses:

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

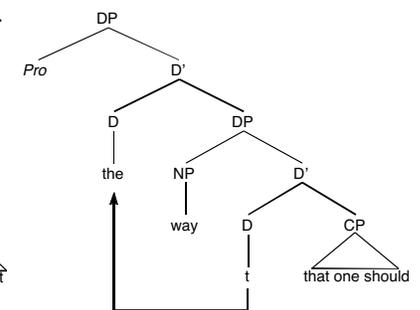
- (28) a. \*the Paris  
 b. the old Paris  
 c. the Paris that I love  
 (from Jackendoff 1977)

- (28) a. [<sub>VP</sub> treat John with kid gloves] ("treat carefully") MANNER  
 b. [<sub>VP</sub> rub John the wrong way] ("bother") MANNER  
 c. [<sub>VP</sub> put John on the spot] ("confront") LOCATION  
 d. [<sub>VP</sub> kill John with kindness] ("be very solicitous toward") INSTRUMENT

(29) a.



b.



(30) All students that voted for Gore and faculty that voted for Bush.

[<sub>D'</sub> all [<sub>DP</sub> [<sub>DP</sub> students [<sub>D'</sub> t [<sub>CP</sub> that voted for Gore ]]] and [<sub>DP</sub> faculty [<sub>D'</sub> t [<sub>CP</sub> that voted for Bush ]]]]

(31) 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 ]]]]

(32) All students and many faculty who voted for Gore

[<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 Gore ]

**Semantics:** RCs can be analyzed as added arguments of D. Let D(X,Y) be a dyadic determiner relation where X and Y have the roles  $\Theta_{SCOPE}$  and  $\Theta_{RESTRICT}$ , resp. Define D', an extension of D, such that D'(X,Y,W) iff D(X,Y $\cap$ W).

(33) a. Every boy [that you saw] [except John]

b. ??Every boy [except John] [that you saw]

c. [<sub>DP</sub> Pro [<sub>D'</sub> every [<sub>DP</sub> boy [<sub>D'</sub> t [<sub>DP</sub> that you saw [<sub>D'</sub> t [<sub>PP</sub> except Bill ]]]]]]]]

(34) a. [<sub>D</sub> every ]

$\Rightarrow$  EVERY-EXC(X,Y,Z)

b. [<sub>D'</sub> every [<sub>PP</sub> except Bill]]

$\Rightarrow$  EVERY-EXC(X,Y)

c. [<sub>DP</sub> [that you saw] [<sub>D'</sub> every [<sub>PP</sub> except Bill]]]

$\Rightarrow$  EVERY-EXC'(X,Y,W)

d. [<sub>DP</sub> boy [<sub>D'</sub> every [<sub>DP</sub> that you saw [<sub>D'</sub> t [<sub>PP</sub> except Bill ]]]]]]

$\Rightarrow$  EVERY-EXC(X,Y)

$\Rightarrow$  EVERY-EXC(X)

### 5.0 Other D-Modifiers

This view can be extended to other postnominal PPs & APs (35)-(36). The intersective semantics for RCs generalizes to these categories.

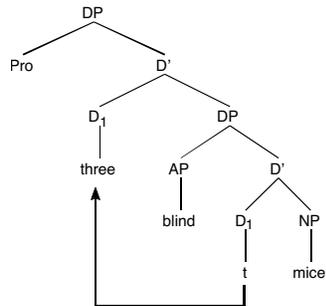
- (35) a. the man [**pp** at the podium] [**pp** in a grey suit]
- b. three women [**AP** present] [**AP** capable of lifting a sofa]
- c. every book [**pp** on the shelf] [**AP** published since WWII ]

(36) [DP *Pro* [D' every [DP book [D' t [DP [**pp** on the shelf] [D' t [**AP** published since 1965 ]]]]]]]

What about prenominal APs??

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

### (38) Base Generation?



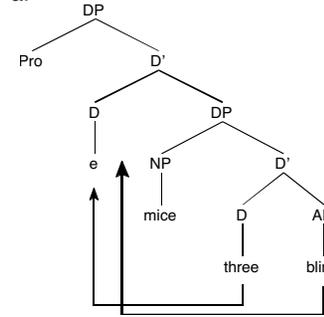
(39)  $\Theta$ SCOPE >  $\Theta$ X >  $\Theta$ RESTRICT

- (40) 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

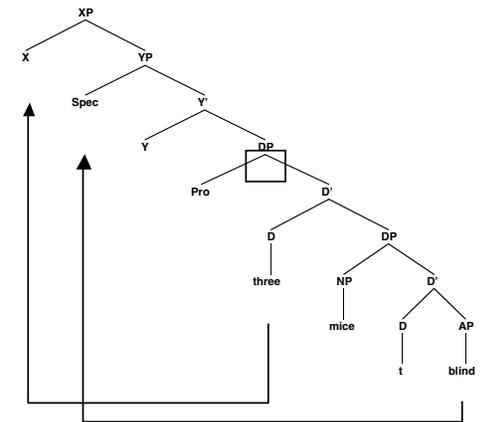
**Idea:** Resurrect the hypothesis that attributive APs originate in the position of relative

clauses, and achieve their surface position by movement:

(41) a.



b.



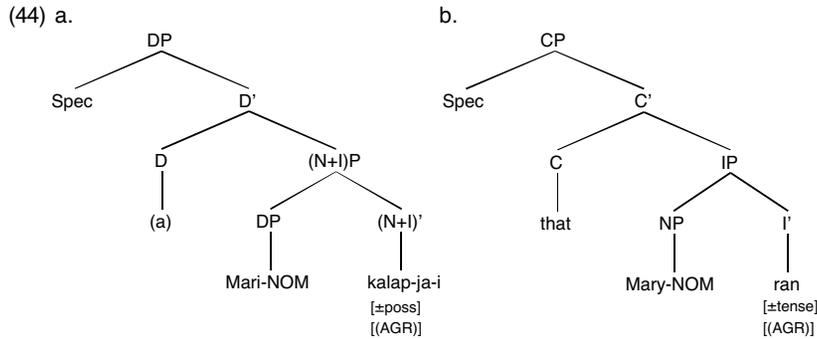
### 5.0 Prenominal Genitives

The postulation of a *Pro* subject in DPs has strong consequences for the analysis of prenominal genitives (42a-d):

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

Abney (1987) assimilates genitive DPs to clauses (IPs), with the possessor in subject position. Szabolsci (1983) extends the analogy with Hungarian examples like (43), where possessor & definite article co-occur. S views the latter as C-like (44a,b):

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



The analysis developed here does not support the sentential view, however:

- The highest argument position in DP - its thematic "subject" - is the scope argument *Pro*.
- The possessor cannot be structurally parallel to a subject (and, by extension, the Hungarian definite D cannot be parallel to a C).

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

### 5.1 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.

- (45) a. [<sub>DP</sub> *Pro* e [<sub>DP</sub> John's [<sub>D'</sub> **THE** briefcase]]]  
 b. [<sub>DP</sub> *Pro* **THE** [<sub>DP</sub> John's [<sub>D'</sub> t briefcase]]]

This makes genitive DPs triadic, with the two lower arguments standing in a possessive relation. What is this parallel to in VP? Double objects (DOs)!

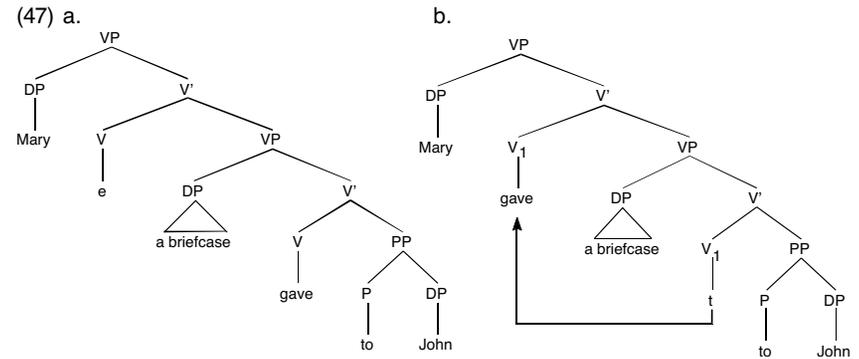
- (46) a. [<sub>VP</sub> Mary e [<sub>VP</sub> John [<sub>V</sub> **gave** a briefcase]]]  
 b. [<sub>VP</sub> Mary **gave** [<sub>VP</sub> John [<sub>V</sub> t a briefcase]]]

**Idea:** Genitive nominals are not clause-like, with the possessor analogous to a subject, and the definite D parallel to C. Rather they are **VP-like**, with the possessor analogous to an object, and the definite D parallel to V.

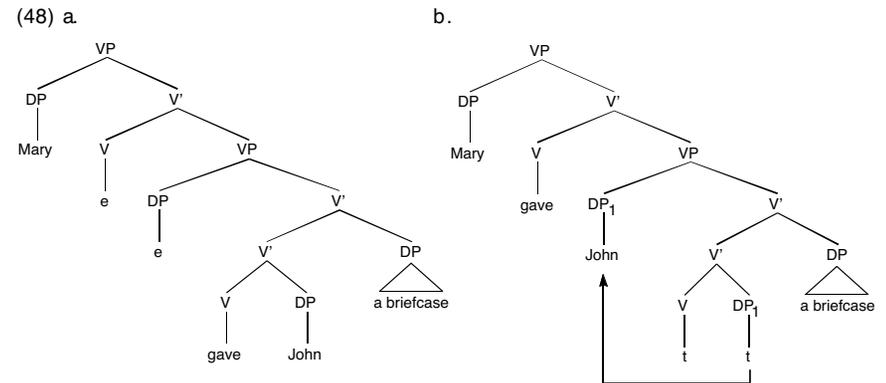
More simply: genitive nominals are the DP-equivalents of DO constructions.

### 5.1.1 Prepositional Datives and "Dative Shift" in VP

In Larson (1988), prepositional datives have a direct V-raising derivation (47a,b):



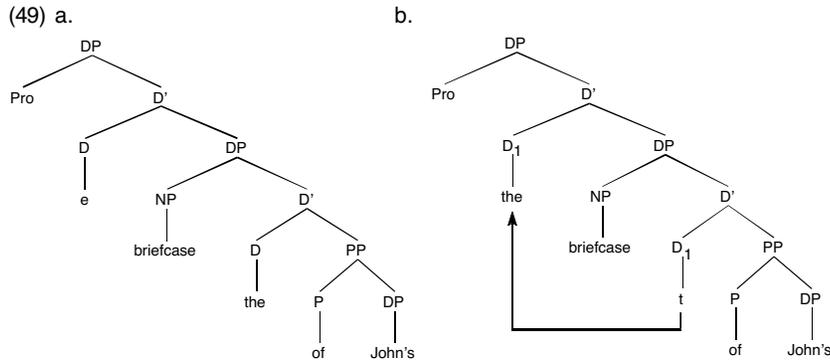
By contrast, DO constructions involve a modern version of "dative shift" (48a,b).



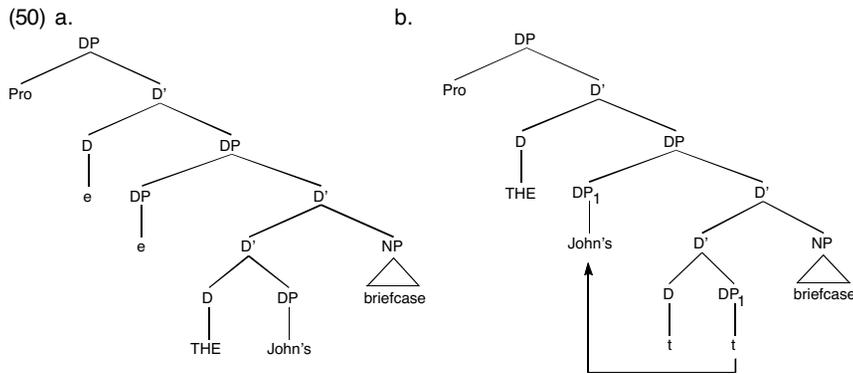
This view respects a theory of projection; *John* ( $\theta_{GOAL}$ ) is initially projected below a *briefcase* ( $\theta_{THEME}$ ), in accordance with the  $\theta$ -hierarchy

### 5.1.2 Prepositional Genitives and "Genitive Shift" in DP

This analysis of prepositional datives, double object structures, and their relation can be extended to genitives. Prepositional genitives get a direct D-raising derivation (49a,b):



By contrast, pronominal genitives involve "genitive shift" (50a,b).



Again, this view respects a strong theory of projection; *John's* ( $\Theta_{\text{NOBLIQUE}}$ ) is initially projected below *briefcase* ( $\Theta_{\text{RESTRICT}}$ ), in accordance with the  $\Theta$ -hierarchy for Ds.

### 5.2 Consequences

This analysis claims:

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

### 5.2.1 Non-Thematic Genitives

In non-thematic genitives, the only  $\Theta$ -role assigned by N (*briefcase*, *arm*, *accessories*, *afternoon*) is the usual one going to the external argument (51a-c);

- (51) a. John's briefcase (is on the veranda)  
 b. Mary's arm (is tanned)  
 c. Men's accessories (are in the next aisle)  
 d. Jill's afternoon (was hectic).

- (52) a. [DP the briefcase of John's ]  
 b. [DP THE John's briefcase \_\_\_\_\_ ]

A movement account of non-thematic pronominal genitives is not new. Ross (1967, 1981), Chomsky (1972), Stockwell, Schacter and Partee (1973), and McCawley (1988) all propose analyses with the equivalent of (52) at some derivational stage.

- (53) McCawley (1988)  
 a. the briefcase [which is John's]  
 b. the briefcase [John's] (from (46a) by Relative Clause Reduction)  
 c.i. the briefcase [of John's] (from (46b) by of-insertion)  
 ii. John's briefcase \_\_\_\_\_ (from (46b) by fronting DP's)

In this analysis, pronominal 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 that that RC morphology in Dyirbal (54a) also occurs in genitives (54b). Dixon captures this fact by deriving the latter from the former transformationally.

- (54) 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 -**RELERG** bite-TNS  
 'The man's dog bit the child'

### 5.2.2 Thematic Genitives

"Genitive shift" analysis appears problematic for cases like (48)-(49). In (48), *John* seems to receive  $\Theta_{\text{AGENT}}$  from N; in (49) *John* seems to get  $\Theta_{\text{THEME}}$  from N (on one reading). This motivates the clausal analogy (57)-(58).

- (55) a. John's examination of the plan (cf. *John completed the plan.*)  
 b. John's selection of the winner (cf. *John selected the winner.*)
- (56) a. John's election (cf. *They elected John.*)  
 b. John's grandmother (cf. *The grandmother of John*)  
 c. John's picture

(cf. *A picture of John*)

- (57) a. [John's selection of the winner]  
 b. [John selected the winner]
- (58) a. [ the election of **John** ]  
 b. [ **John's** election \_\_\_\_\_ ]  
 c. John was elected \_\_\_\_\_

On the current analysis, the apparent  $\Theta$ -marking by N must be an illusion.

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

Burton's (1995) semantic analysis of genitives appears to fit this conclusion. His account is based on a proposal by Higginbotham (1983) and Partee (1987) (among others) that possessive definites contain a free variable R over relations.

In non-thematic genitives (59a), R is determined deictically (59b).

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

Thematic genitives (60a) are ambiguous. There is: (i) a (nonfavored) non-thematic reading where R is determined deictically (60b), and (ii) a (favored) thematic reading where R is given by N (60c).

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

Burton proposes that the semantic structure of possessive *John's N* is uniformly (61a) and that thematic readings occur by taking N as the antecedent of R (61b).

- (61) a. [the x: N(x) & R(x,John)]  
 b. [the x:  $\exists y$ [wife(x,y) & wife(x,John)]  
 |\_\_\_\_antecedes\_\_\_\_|

This means that in thematic genitives, the possessor is never a direct argument of N. Rather, it is an argument of the R-variable in D, which gets its value through N.

This proposal appears to work for all thematic nominals and nominalizations. If it is correct, then the second main assumption of the genitive shift account appears sustainable.

### Summary

- Quantificational semantics provides a theory of argument structure for an entirely non-verbal set of categories, and where verbal notions don't apply.
- This permits an account of structure projection for these non-verbal categories following standard principles relating argument structure to syntax.
- A candidate theory of projection has been presented here for DP, involving a tentative set of quantificational thematic roles, and principles for projecting "shell structures".
- This theory suggests many analogies and comparisons between Vs & VP-structure and Ds & DP-structure (valence, attachment of modifiers, argument alternations)
- This theory can, in principle, be extended to any categories with quantificational semantics (which involve restrictions, scopes, modifiers, etc.). For example, there is a natural extension to DegP

### References

- Abney, S. (1987) *The English Noun Phrase in Its Sentential Aspect*. unpublished Ph.D dissertation, MIT.
- Barwise, J. and R. Cooper (1981) "Generalized Quantifiers and Natural Language," *Linguistics and Philosophy* 4: 159-219
- Burton, S. (1995) *Six Issues to Consider in "Choosing a Husband"*. unpublished Ph.D dissertation, Rutgers Univ.
- Chomsky, N. (1970) "Remarks on Nominalization," in R. Jacobs and P. Rosenbaum (eds.) *Readings in English Transformational Grammar*. (pp. 184-221) Boston: Ginn.
- Chomsky, N. (1994) "Bare Phrase Structure," *MIT Occasional Papers in Linguistics* 5. Dept. of Linguistics and Philosophy, MIT.
- Chomsky, N. (1995) *The Minimalist Program*. Cambridge, MA: MIT Press
- Dixon, R.M.W. (1966) "Relative Clauses and Possessive Phrases in Two Australian languages," *Language* 45: 35-44
- Frege, G. (1953) *The Foundations of Arithmetic*. Trans. J.L. Austin. New York: Philosophical Library. Originally published 1884.
- Ghozati, Seyed Ali-Abbas. (2000) *On the Structure of the Persian Noun Phrase*. unpublished Senior Honors Thesis, Stony Brook Univ.
- Giorgi, A. and P. Longobardi (1990) *The Syntax of Noun Phrases*. Cambridge: Cambridge University Press.
- Grimshaw, J. (1990) *Argument Structure*. Cambridge, MA: MIT Press.
- Grimshaw, J. and A. Mester (1988) "Light Verbs and  $\Theta$ -Marking," *Linguistic Inquiry* 19: 205-232.
- Higginbotham, J. (1983) "Logical Form, Binding and Nominal," *Linguistic Inquiry* 14: 395-420.
- Jackendoff, R. (1977) *X-bar Syntax*. Cambridge, MA: MIT Press.
- Kayne, R. (1993) *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.
- Keenan, E. and Y. Stavi (1983) "A Semantic Characterization of Natural Language Determiners," *Linguistics and Philosophy* 9: 253-326.
- Kishimoto, Hideki. 2000. "Indefinite Pronouns and Overt N-Raising," *Linguistic Inquiry* 31:557-566.
- Kuroda, S-Y. (1968) "English Relativization and Certain Related Problems," *Language* 44:

- 244-266.  
 Larson, R. (1988) "On the Double Object Construction." *Linguistic Inquiry* 19: 335-391.  
 Larson, R. (1989) "Light Predicate Raising." MIT Lexicon Project Papers 27. Cambridge: MIT.  
 Larson, R. (1990) "Double Objects Revisited: Reply to Jackendoff." *Linguistic Inquiry* 21: 589-632.  
 Larson, R. (1991) "Promise and the Theory of Control" *Linguistic Inquiry* 22: 103-139.  
 Larson, R. and F. Marusic (in press) "On Indefinite Pronoun Structures with APs: Reply to Kishimoto." *Linguistic Inquiry*.  
 McCawley, J. (1988) *The Syntactic Phenomena of English*. Chicago: Chicago University Press.  
 Ross, J. R. (1967) *Constraints on Variables in Syntax*. unpublished Ph.D. dissertation, MIT.  
 Ross, J. R. (1981) *Infinite Syntax*. New York: Ablex.  
 Saito, M. and H. Hoshi (1998) "Japanese Light Verb Construction and the Minimalist Program," in R. Martin, D. Michaels, and J. Uriagareka (eds.) *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*. Cambridge: MIT Press.  
 Samiian, V. (1994) "The Ezafe Construction: Some Implications for the Theory of X-bar Syntax," in M. Marashi (ed.) *Persian Studies in North America*. (pp. 17-41) Bethesda, MD: Iranbooks.  
 Szabolsci, A. (1983) "The Possessor that Ran Away From Home," *The Linguistic Review* 3: 89-102.  
 Smith, C. (1964) "Determiners and Relative Clauses in Generative Grammar," *Language* 40: 37-52.  
 Stockwell, R., P. Schacter, and B. Partee (1970) *The Major Syntactic Structures of English*. New York: Holt, Rinehart and Winston.

## APPENDIX: The Post-nominal Source of Attributive APs

### A.1 Indefinite Pronoun Constructions (Larson & Marusic *in press*)

- (1) a.i. every **interesting** book ii. \*every book interesting  
 b.i. a **tall** person ii. \*a person tall
- (2) a.i. \*interesting **everything** ii. **everything interesting**  
 b.i. \*tall **someone** ii. **someone tall**
- (3) a. [<sub>DP</sub> every thing [<sub>NP</sub> **interesting** [<sub>NP</sub> \_\_\_ ]]] (Abney 1987; Kishimoto 2000)  
 b. [<sub>TP</sub> John [<sub>TR</sub> has [<sub>VP</sub> **often** [<sub>VP</sub> \_\_\_ eaten bureks ]]]

#### Point 1: Some Adjectives Can, and Others Must, Occur Postnominally

- (4) a.i. the **visible** stars b.i. the **stolen** jewels  
 ii. the stars **visible** ii. the jewels **stolen**
- (5) a. every woman **present** b. \*every **present** woman (spatial sense)
- (6) a. the children **asleep/abroad/astir**  
 b. ?\*the **asleep/abroad/astir** children
- (7) a. [<sub>DP</sub> the [<sub>NP</sub> individuals [<sub>AP</sub> **responsible** ]]]  
 b. [<sub>DP</sub> every [<sub>NP</sub> woman [<sub>AP</sub> **present** ]]]

#### Point 2: This Means that APs in IPCs Can Have a Postnominal Source

- (8) a. everybody **responsible**  
 b. [<sub>DP</sub> every **body** [<sub>NP</sub> [<sub>AP</sub> **responsible** ] \_\_\_ ]]]  
 c. [<sub>DP</sub> every **body** [<sub>NP</sub> \_\_\_ [<sub>AP</sub> **responsible** ]]]

**Point 3:** Pre- and post-nominal APs behave differently in a variety of ways. If both (49b,c) were available, we would expect IPCs with APs to behave ambiguously. This is not what we find.

