The Projection of DP
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Main Points:
- Significant aspects of syntactic structure (merge) are held to derive from argument structure (Θ-roles, valency, selection)
- The fundamental notions of argument structure are uniformly verb-derived (e.g., ΘAGENT, ΘTHEME, ΘGOAL)
- 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. 3x[ man(x) \land arrive(x)]
     b. Vx[ whale(x) \rightarrow 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. ALL{(x: x is a mammal), (x: x is a whale)}

(7) a. Some whales are mammals.
     b. SOME{(x: x is a mammal), (x: x is a whale)}

(8) a. ALL(X,Y) \# IY – XI = 0     (9) a. NO(X,Y) iff IY \cap XI = 0
     b. SOME(X,Y) \# IY \cap XI > 0     b. MOST(X,Y) iff IY \cap XI > IY \cap XI
     c. THE(X,Y) iff IY – XI = 0 & IYI = 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.

(10) a.                          b.
     D            D
     \rightarrow     \rightarrow
     the man      the man

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).

(11) a.                          b.
     D                  D
     \rightarrow     \rightarrow
     the man      the man

     DP
     \rightarrow     \rightarrow
     completion of the plan
     [TNS] complete the plan

(12) a. XP \rightarrow YP  X’
     b. X’ \rightarrow 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 AGENT > THEME > GOAL > OBQUE 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.
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)

2.3 Projecting DP Shells

2.3.1 A Thematic Hierarchy for DP

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

V: θ_{AGENT} > θ_{THEME} > θ_{GOAL} > θ_{OBLIQUE}
D: θ_{SCOPE} > θ_{RESTRICT} > θ_{NOBLIQUE}

The principles of Locality and Hierarchy remain the same.
2.3.2 The Scope Argument

(18)  a. \[
\begin{array}{c}
\text{DP} \\
\text{DP} \\
\text{NP} \\
\text{swim}
\end{array}
\]

b. \[
\begin{array}{c}
\text{D'} \\
\text{DP} \\
\text{NP} \\
\text{swim}
\end{array}
\]

If DP is an argument of V, and VP is simultaneously an argument of D, how can we find a structure satisfying their joint requirements under Locality??

Proposal: The scope argument of D is an independent, inaudible, pro-predicate element Pro, licensed by D, and projected in Spec DP (19). Its semantic value is determined at LF from the derived predicate that is sister to DP (20):

(19) \[
[\text{DP Pro } [\text{D' } \text{D NP }]]_{\text{\Theta_{SCOPE}}} \]

(20) \[
[\text{DP Pro } [\text{D' } \text{D NP }]]_{\text{\Theta_{RESTRICT}}} \]

2.3.3 N-adic Ds

Projecting DP on analogy with VP suggests many parallels. E.g., notions of "transitivity" and "intransitivity" seem to extend naturally in this framework:

(21)  a. \[
\begin{array}{c}
\text{DP Pro } [\text{D' the man } ]_{\text{\Theta_{SCOPE}}} \\
\text{D' } \\
\text{D }
\end{array}
\]
   "dyadic/transitive" D

b. \[
\begin{array}{c}
\text{DP Pro } [\text{D' he } ]_{\text{\Theta_{RESTRICT}}} \\
\text{D' } \\
\text{D }
\end{array}
\]
   "monadic/intransitive" D

(22)  a. \[
\begin{array}{c}
\text{DP Pro } [\text{V laughed a laugh } ]_{\text{\Theta_{RESTRICT}}} \\
\text{V' } \\
\text{V}
\end{array}
\]
   Cognate V-complement

b. \[
\begin{array}{c}
\text{DP Pro } [\text{D' he himself } ]_{\text{\Theta_{RESTRICT}}} \\
\text{D' } \\
\text{D }
\end{array}
\]
   Cognate D-complement?

Question: What about triadic/ditransitive Ds? Keenan and Stavi (1983) suggest:

(23)  a. \text{Every boy except John dances.}

b. \text{No boy except John dances.}

c. \text{More women than men dance.}

d. \text{As many women as men dance.}

(24) a. \text{EVERY-EXCEPT}(X, Y, Z) \iff \text{ALL}(X, (Y-Z)) \land \text{NO}(X,Z)

b. \text{NO-EXCEPT}(X, Y, Z) \iff \text{NO}(X, (Y-Z)) \land \text{ALL}(X,Z)

c. \text{MORE-THAN}(X, Y, Z) \iff \text{IY} \cap \text{XI} > \text{IZ} \cap \text{XI}

d. \text{AS MANY-AS}(X, Y, Z) \iff \text{IY} \cap \text{XI} \geq \text{IZ} \cap \text{XI}

Proposals: (a) English contains a light determiner \&
(more generally, light heads exist in every category)
(b) \text{than/as/except}-PPs are oblique D arguments (\Theta_{NOBLIQUE})

(25) a. \[
\begin{array}{c}
\text{NP boy } \\
\text{D'} \\
\text{D' }
\end{array}
\]

b. \[
\begin{array}{c}
\text{DP boy } \\
\text{D' } \\
\text{D' }
\end{array}
\]

c. \[
\begin{array}{c}
\text{D' every } \\
\text{D' } \\
\text{D' }
\end{array}
\]

d. \[
\begin{array}{c}
\text{D' except John } \\
\text{D' } \\
\text{D' }
\end{array}
\]
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. [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

(30) All students that voted for Gore and faculty that voted for Bush.
    [D all DP [DP students [D t DP that voted for Gore ] and [DP faculty [D t [CP that voted for Bush ]]]]]

(31) a. Max met Bill yesterday and Sue Tuesday.
    b. [v met [VP [vP Bill [v t [DP yesterday ]] ] and [VP Sue [v t [DP Tuesday ]]]]

(32) All students and many faculty who voted for Gore
    [DP [CP Pro [D All [DP students [D t ] ] and [DP Pro [D many [DP faculty [D t ]] [CP 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 θSCOPE and θRESTRICT. Define D', an extension of D, such that D'(X,Y,W) iff D(X,Y,W).

(33) a. Every boy [that you saw] [except John]
    b. ??Every boy [except John] [that you saw]
    c. [DP Pro [D' every [DP boy [D t [DP that you saw [D t [PP except Bill ]]]]]]]

(34) a. [D every ]
    b. [D' every [PP except Bill]]
    c. [DP [that you saw] [D' every [PP except Bill]]]
    d. [DP boy [D' every [DP that you saw [D' t [PP except Bill ]]]]]
    => EVERY-EXC(X,Y,Z)
    => EVERY-EXC(X,Y)
    => EVERY-EXC(X,Y,W)
    => EVERY-EXC(X,Y)
    => EVERY-EXC(X,Y,W)
    => EVERY-EXC(X,Y)
    => EVERY-EXC(X,Y)
    => EVERY-EXC(X,Y)
    => EVERY-EXC(X,Y)

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]


What about prenominal APs?

(37) a. The tall woman
   b. Every beautiful house
   c. Three blind mice

(38) Base Generation?

\[ \Theta \text{SCOPE} > \Theta \text{X} > \Theta \text{RESTRICT} \]

(39) 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

5.0 Prenominal Genitives

The postulation of a \( \Theta \text{Pro} \) 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. Szabolcsi (1983) extends the analogy with Hungarian examples like (43),
where possessor & definite article co-occur. \( \tilde{S} \) 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. [DP Pro e [DP John’s [DP THE briefcase]]]
   b. [DP Pro THE [DP John’s [DP t a 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. [VP Mary e [VP John [VP gave a briefcase]]]
   b. [VP Mary gave [VP John [VP 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.

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

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

(47) a. [VP V [DP a briefcase [VP gave P to John]]]
   b. [VP V [DP a briefcase [VP V V to John]]]

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

(48) a. [VP Mary V e [VP John V gave a briefcase V to John]]
   b. [VP Mary V gave [VP John V V to John]]

This view respects a theory of projection; John (ΘGOAL) is initially projected below a briefcase (ΘTHEME), in accordance with the θ-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):

(49) a. [DP Mary V gave a briefcase V to John]
   b. [DP Mary V gave a briefcase V V to John]
5.2.1 Non-Thematic Genitives

In non-thematic genitives, the only θ-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 prenominal 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. the briefcase [of John’s] (from (46b) by of-insertion)
   ii. John’s briefcase ___
   (from (46b) by fronting DP’s)

In this analysis, prenominal genitives don’t derive from RCs, but project into the same initial position.

Interesting sideline. 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 njalga- ngu djiitwa- 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. njalga 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 θAGENT from N; in (49) John seems to get θTHEME 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
(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 θ-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: Ǝy[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: Ǝy[wife(x,y) & wife(x,John)]

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

Kuroda, S-Y. (1968) "English Relativization and Certain Related Problems," Language 44:
APPENDIX: The Post-nominal Source of Attributive APs

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

(1) a. every interesting book  
   b. a tall person  

(2) a. *interesting everything  
   b. *tall someone

(3) a. [CP every thing [NP interesting [AP — ]]  
   b. [TP John [T- has [VP often [NP — eaten bureks]]]]

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

(4) a. the visible stars  
   b. the stolen jewels

(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. [CP the [NP individuals [AP responsible]]]  
   b. [CP every [NP woman [AP present]]]

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

(8) a. everybody responsible
   b. [CP every [AP [NP [AP responsible] — ]]]
   c. [CP every [NP [AP 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.
A.1.1 Inflection (Sadler and Arnold 1994)

(9) a. a [23 inch long] rope b. a rope [23 inches long]
(10) a. a [two mile wide] river b. a river [two miles wide]
(11) [cf. any thing [np 23 inch long [dp __ ]]]
(12) a. anything [23 inch/23 inches long]
b. everything [two mile/two miles wide]

Result: The inflectional pattern of IPCs is that of post-, not pre-nominal adjectives.

A.1.2 Recursion I

(13) a. The explored navigable rivers have been photographed by satellite.
b. All the tiny shiny visible stolen jewels were lying on the table.
(14) a. "the rivers explored navigable
b. "the jewels visible stolen
c. The rivers [explored] [navigable in the summer] were surveyed.
d. He wanted to identify a man [present] [capable of lifting a horse].
(15) a. [np John [t. has [vp obviously [cp completely [vp __ ] lost his mind ]]]]]
b. "[cp every thing [np large [np heavy [np __ ]]]] (cf. every large heavy thing)
(16) a. everyone [present] [capable of lifting a horse]
b. anyplace [available] [accessible by bike]
c. someone [eligible] [born before 1965]
d. everything [frozen] [older than fourteen weeks]

Result: The recursion pattern of IPCs is that of post-, not pre-nominal adjectives.

A.1.3 Recursion II

(17) a. everyone [tall] ["heavy"] b. everyone [heavy] ["tall"]
(18) a.i. everyone [tall] [present] i. "everyone [present] [tall]
b.i. something [large] [spotted] i. "something [spotted] [large]

Result: IPCs allow postnomially an adjective that usually can only occur prenominally. But only one such A can occur, and it must be adjacent to N.

My Proposal: In DP, as in TP, there are Case-assigning relations between the head and its selected nominal complement: D assigns Case to NP.

(19) [cp Pro the book ]

Attributive APs originate postnomially and (as [+NPs]) require Case. But D (like V) has one Case to assign. Hence APs typically must raise to get Case by concord:

(20) [cp Pro the book heavy ]

Postnominal "APs" are actually reduced RCs (CPs); they don't require Case.

In IPCs we are seeing the postnominal base-position of attributive As. NP incorporates into D, freeing its one Case for assignment to AP. Hence one AP can stay.

(21) [cp Pro every-thing heavy ]

A.2 The Ezafe Construction (Samilian 1994, Ghozati 2000)

In Farsi & Kurdish, adjectives, nominal complements, genitives, etc. all appear postnomially, joined by a "linker particle" called ezafe (EZ) (22); EZ also occurs joining within certain nominal PPs (23):

(22) a. sag-é sãh-yé kûchek dog-EZ black-EZ small
    b. dars-é chahâróm lesson-EZ fourth
    c. manzel-é John house-EZ John 'John's house'
    d. hordan-é ab drinking-EZ water
    e. forushandé-yé ketáb seller-EZ book
    f. del-é sang heart-EZ stone
    g. shahr-EZ Tehran city-EZ Tehran
    h. otaq-i ke bozorg ast room-REL that 'big is

    b. Ali's small house on the beach

Samilian (1994) argues convincingly that EZ is a Case-marker (cf. of).

Proposal: Ezafe-languages have a generalized oblique Case-marking strategy that permits the underlying post-nominal position of D-complements to surface directly.