

# Maybe Not That Many People Really Believe The DP Hypothesis

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## 1 Introduction

- **Geoff's presupposition:** The DP hypothesis is quasi-universally accepted within the minimalist community.
- **Geoff's assertion:** The minimalist community should know better.
- **My position:** I don't want to disagree with Geoff's assertion, but I have my doubts about his presupposition.
  - Many minimalists don't care very much about the DP hypothesis. If you're working on something predominantly VP-related, say, then it may be a case of "If the DP hypothesis is good enough for Chomsky, then it's good enough for me."
  - There is more than one DP hypothesis. Even if you buy the hypothesis, you may do so for very different reasons from Abney (1987).
  - Among minimalists who care about the structure of noun phrases, it is not clear that there is a consensus in favour of the DP hypothesis in any strict sense.
- **I've been collecting hypotheses.** I would like to distinguish the following possibilities:
  - The DP hypothesis is right: noun phrases are headed by determiners (Abney 1987);
  - The DP hypothesis is wrong and the NP hypothesis is right: noun phrases are headed by nouns (Geoff);

- The DP hypothesis is right in some cases, and the NP hypothesis is right in others (Chierchia 1998b,a);
  - The DP hypothesis is right in at least some languages, but DP has different properties in different languages w.r.t. its A/A' properties (close variant, maybe not actually defended?: noun phrases are DPs if [Spec,DP] is an escape hatch for successive cyclic movement, but NPs otherwise) (Horrocks & Stavrou 1987);
  - The DP hypothesis didn't go far enough ("magic of the  $\lambda$ -calculus" version) (Borer 2005);
  - The DP hypothesis didn't go far enough (cartographic version) (Cinque 1994);
  - The DP hypothesis is more or less indistinguishable from the NP hypothesis within a theory of extended projections (van Riemsdijk 1998)
- **More generally**, I want to point out a difference between two sorts of arguments for the existence of DPs:
    - *Arguments from the syntax–semantics interface*: “we have a good idea what our semantics looks like, and we want our syntax to resemble our semantics in manners 1, . . . ,n. So our syntax should look as follows, even if there are simpler alternatives.”
    - *Arguments from pure syntax, or morphology*: “we have the following facts about word order regularities and/or morphology, and we want to capture these in the following maximally simple fashion, even if we slightly complicate the mapping to semantics.”

Generally, these two types of arguments are pulling in different directions, but I don't think there's a complete incompatibility. Extended projections score points because they very naturally accommodate both types of argument.

## 2 The Hypotheses

### 2.1 The DP Hypothesis Is Right

Geoff will tell you about this one.

### 2.2 The NP Hypothesis Is Right

Geoff will also tell you about this one.

## 2.3 Both Hypotheses Are Sometimes Right

Chierchia (1998b,a) presents a very wide-ranging body of work, which introduces at least three interrelated themes:

- **A theory of the structure of the domain of nominal reference:** in particular, mass nouns denote sets of elements in the same structure as count nouns, as opposed to a separate structure as in Link (1983). The difference is that mass nouns have no singular–plural distinction.
- **A theory of type-shifting**, which needn't concern us hugely here.
- **A defence of the notion of “semantic parameter”.** This is where the action is for us.

The semantic parameter works as follows: there is a more or less universal structure to  $D_e$ , and a more or less universal syntax of noun phrases, but the mapping between the syntactic structure and the structure of the denotations varies.

- **Semantics:** a join atomic semilattice (a structure with a set of atoms, closed under joins). Singular terms and regular proper names denote atoms (type  $e$ ), plurals denote nonatomic elements (modelled as characteristic functions of sets, type  $\langle e, t \rangle$ ). Mass terms obliterate the singular–plural distinction (i.e. plural denotations are not ideals, but mass denotations are).<sup>1</sup> In the mass case, there is therefore a one-to-one correspondence between denotations (ideals) and the elements generating those ideals. I suppose this is true trivially in the singular case, too. It doesn't hold in the plural case, because plural denotations are not ideals. A mass denotation can therefore be equally effectively represented as a (characteristic function of a) set (type  $\langle e, t \rangle$ ) or an individual (type  $e$ ).

### Some pictures of denotations:

$\{a, b, c, d\}$	$\Leftarrow$ Plurals (as sets)
$\{a, b, c\}$ $\{a, b, d\}$ $\{a, c, d\}$ $\{b, c, d\}$	$\Leftarrow$ Plurals
$\{a, b\}$ $\{a, c\}$ $\{a, d\}$ $\{b, c\}$ $\{b, d\}$ $\{c, d\}$	$\Leftarrow$ Plurals
a            b            c            d	$\Leftarrow$ Singulars

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<sup>1</sup>Empirical claim: the basic case of a mass term is not *water* or *justice*, where the atoms are not readily individuated, but *furniture*, where the atoms are easily individuated. In other words, the mass–count distinction doesn't necessarily inhere in the structure of the object referred to itself, which is why we get pairs like *coins* vs. *change*. This is the radical departure from Link, who needed a separate denotation space for mass terms, because he assumed that mass denotations did not have atomic parts.

$\{a, b, c, d\}$	$\Leftarrow$ Mass terms
$\{a, b, c\}$ $\{a, b, d\}$ $\{a, c, d\}$ $\{b, c, d\}$	$\Leftarrow$ Any of these
$\{a, b\}$ $\{a, c\}$ $\{a, d\}$ $\{b, c\}$ $\{b, d\}$ $\{c, d\}$	$\Leftarrow$ as a set or
a                  b                  c                  d	$\Leftarrow$ as an individual

- **Syntax:** N projects NP. D, if it exists, projects DP and takes NP as its complement. D need not exist. (That’s the point).
- **The mapping parameter:** Languages can vary as to whether NP can denote an argument (type e), a predicate (type  $\langle e, t \rangle$ ), or both.
  - **What it means for an NP to function as an argument:** essentially, the NP works as a proper name, either of an ordinary individual (a,b,c,d) or of a kind (as in Carlson 1977)
  - **What it means for an NP to function as a predicate:** the same things we’ve always been told: they function as restrictors to determiners, they need a determiner to refer, etc.

**Some case studies:**

- (1) **Chinese:** [+arg, -pred]
  - a. **Generalised bare arguments:** NPs are always of the right kind to denote, so determiners are unnecessary
  - b. **All nouns have mass denotations:** This is not a statement about anything extralinguistic, but just means that the way nominals map to  $D_e$  in Chinese is such that there is no place for a singular–plural distinction (pluralities are always  $\langle e, t \rangle$ , which goes against the Chinese parameter setting). So therefore, also:
  - c. **No plural** (matching the impossibility of pluralising mass nouns without imposing some kind of “container” interpretation), and:
  - d. **Generalised classifier system** (for making mass nouns countable)<sup>2</sup>
- (2) a. yí lì mǐ  
one CL rice  
‘one (grain of) rice’

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<sup>2</sup>Classifiers are ‘partial functions from pluralities into sets of atoms constituted by members of the pluralities’ (Chierchia 1998b:72). So to get from a mass denotation (type e) to something compatible with a classifier, you first need to find the set associated with the mass denotation (the supremum), and then apply the classifier function to that. This is one place where the theory of type shifting comes in. We can’t go there today.

- b. liǎng fū mǐ  
two CL rice  
'two (grains of) rice'
- c. yí zhāng zhuōzi  
one CL table  
'one (piece of) table'
- d. liǎng zhāng zhuōzi  
two CL table  
'two (pieces of) tables'
- e. wǒ kànjiàn xióng le  
I see bear ASP  
'I saw (some/the) bears.' (Chierchia 1998a:354)

(3) **Romance:** [-arg, +pred]

- a. **No bare arguments:** NP is ⟨e, t⟩, so a determiner is required to form something of the right type to be an argument. Some languages have empty determiners (Italian), some don't (French).
- b. **If a language has an empty determiner, it should be subject to ECP effects.**
- c. There is a **mass/count distinction**, and so a lexical **singular/plural distinction** is possible, and there will be **no generalised classifier system**.

(4) a. \*Enfants sont venus chez nous.

'Kids have come by us.'

- b. \*J'ai mangé biscuits dans mon lait.

'I ate cookies with my milk.' (Chierchia 1998a:355)

(5) a. \*Bambini sono venuti da noi.

'Kids [have] come by us.'

- b. Ho preso biscotti con il mio latte.

'(I) had cookies with (the) my milk.' (Chierchia 1998a:356)

(6) **Germanic, Slavic:** [+arg, +pred]

- a. **Mass/count distinction, singular/plural distinction, no generalised classifier system.**
- b. **Mass and plural nouns can appear as bare arguments**, singular count nouns can't. (Reason: to be a bare argument, you have to be of type e, which means you're a kind denotation. But 'only those [individual concepts] that identify classes of objects with a sufficiently regular function and/or behavior will qualify [as kinds].' (Chierchia 1998a:350)

- c. **Languages with fewer articles make more use of covert type-shifting.**  
 Type shifting is construed as a last resort, selecting an operator from among the family defined by Partee (1987). English (and Germanic in general) has *the* ( $\approx \iota, \langle e, t \rangle \rightarrow e$ ) and *a* ( $\approx \exists, \langle e, t \rangle \rightarrow \langle \langle e, t \rangle, t \rangle$ ), so such type shifts are out as a last resort in English. Slavic generally lacks such articles, so such last-resort type-shifting is not blocked.
- (7) a. Ja kupil khleb (\*khliby)  
 I bought bread (\*breads)
- b. Ja kupil 3 \*(batona) khleba  
 I bought 3 \*(loaves) of bread [**Mass–count distinction**]
- c. V komnate byli malcik i devočka. Ja obratilsja k malciky  
 In (the) room were (a) boy and (a) girl. I turned to (the) boy  
 [**bare count nouns, indefinite and definite**]
- d. Dinosavry vyperli (\*Dynosavr)  
 Dinosaurs (are) extinct (**kind reference with bare plural**)
- e. sobaka obycnoe zyvotnoe  
 (The) dog (is a) common animal (**generic use of bare singular**)

**Comments:**

- The hypothesis that Geoff objects to is tacitly assumed here. If there's a D present, then the noun phrase in question is a DP. No evidence is given for that. Having said that,
- Chierchia does show that there is a lot to be gained by severely limiting the occurrence of null  $D^0$ . It's not assumed to exist in any [+arg, -pred] language (or [+arg, +pred] language?), and it's a matter of lexical idiosyncrasy whether a [-arg, +pred] language has a null determiner, with its distribution constrained by the ECP, or has only overt determiners.
- In the determinerless case, I think it's clear that noun phrases must be treated as NPs (what's the alternative?). In the case with determiners, given that Chierchia's arguments are entirely semantic, I think we can consider ourselves unpersuaded that DPs are necessary.

**2.4 The DP Hypothesis Is Right, But Not All DPs Are Alike**

**Horrocks & Stavrou (1987):** (I believe Szabolcsi has made similar arguments for Hungarian, but without mentioning DP).

- (8) a. (i) to vivlio afto  
 the book this

- ‘this book’
- (ii) to endhiaferon ya to arthro afto  
the interest about the article this  
‘the interest in this article’
- b. (i) afto to vivlio  
this the book  
‘*this* book’
- (ii) ya to arthro afto to endhiaferon  
about the article this the interest  
‘the interest in *this* article’
- c. (i) to vivlio tinos  
the book who-gen  
‘whose book’ (echo?)
- (ii) tinos to vivlio  
who-gen the book  
‘whose book’
- Suggests existence of an A' landing site within the noun phrase in Greek. More specifically, the Greek position equivalent to the pre-head A-position in English is an A'-position.
  - This extra landing site allows CNPC violations:
- (9) pyon akuses ti fimi oti apelisan  
whom heard-2s the story that dismissed-3p  
‘who did you hear the story that they dismissed?’
- *wh*-determiners can no more strand N in Greek than in English. Taken to suggest that DET is not a phrase.
- (10) a. tinos mu ipes pos dhiavases to vivlio  
who-gen me-gen said-2s that read-2s the book  
‘whose book did you tell me you read?’
- b. \*pyon idhes anthropo  
which saw-2s person  
‘Which did you see person?’
- The suggestion is that noun phrases are DPs, but DPs are like IP in English ([Spec,D] is an A-position) and like CP in Greek ([Spec,D] is an A'-position). H&S relate this difference to case-marking: N assigns genitive case to its complement in Greek, but assigns no case to its complement in English. So a moved complement in Greek will be an A'-trace, but an A-trace (passive in NP) in English.

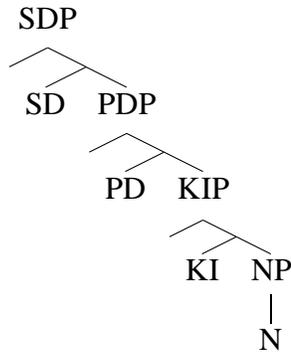
- Assume CP and DP are barriers, and that [Spec,D]

**Comments:**

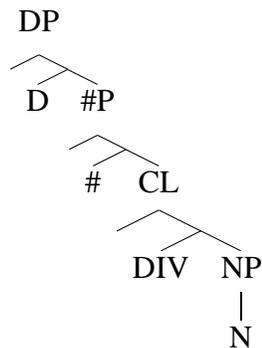
- The extraction site really has to be a specifier position: phrasal, and to the left of the head. Therefore, it needs a head to be a specifier of, and if DET is [Spec,N], then the NP-hypothesis would (a) force us back to a pre-GB version of X'-theory; (b) need to explain why phrasal [Spec,N] can extract from NP, but determiner [Spec,N] can't.
- No account is given of why possessor extraction is impossible in English. We might fall back on the Chomsky (1995) argument: 's is D<sup>0</sup>, and so doesn't form a constituent with [Spec,D]. But as an alternative, it's worth noting that nothing in this paper gives any indication as to the categorial status of noun phrases in English.

## 2.5 The DP Hypothesis Didn't Go Far Enough: Magic of the $\lambda$ -calculus

- **Zamparelli (2000):**



- **Borer (2005):**



**Comments:**

- In both cases, the arguments for this decomposition are primarily semantic.
- Very rare to find both a head and a specifier position filled within the same XP (exception: possessors in English?).

## 2.6 The DP Hypothesis Didn't Go Far Enough: Cartography

### Cinque (1994): the beginning of cartography

- There are restrictions on the number ('apparently not exceeding six or seven' — p.96) and order of attributive adjectives within the noun phrase (not new in itself: see Vendler 1968 for dozens of such restrictions).
- (11) a. poss > cardinal > ordinal > speaker-or. > subj-or. > manner > thematic (p.96)  
 [DP Le [XP sue [XP due [XP altre [XP probabili [XP goffe reazioni [XP immediate [NP t alla tua lettera]]]]]]] (p.95)
- b. poss. > cardinal > ordinal > quality > size > shape > color > nationality  
 (I) suoi due altri bei grandi quadri tondi grigi (p.96)
- Tacit assumption: these restrictions are syntactic in nature.
  - Adjunction to the same category is freely ordered, and so can't capture ordering restrictions.
  - Attributive adjectives are phrasal.<sup>3</sup>
- (12) a. [DP [AP (Extraordinar de) frumos]ul [t portret]]  
 Very beautiful-the picture
- b. [DP Portretul [acesta t [frumos [t]]]]  
 Picture-the this-agr beautiful (p.97)
- Put everything together and 'we must envisage a structure. . . where at least (perhaps at most) seven Spec positions are available for APs'. (Cinque 1994:97)

### Scott (2002): Cinque on growth hormones

- (13) a. Mine's the big red car.

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<sup>3</sup>The XP vs. X<sup>0</sup> status of prenominal adjectives was the subject of a lively debate in the early 90s, which never seemed to reach any real conclusion. See Lamarche (1991), Bernstein (1993), Alexiadou (2001), and many others.

b. \*Mine's the red big car.

- Take this kind of fact, scour the literature for proposed semantic classes of adjective, and see what you end up with. . .
- (14) Determiner > ordinal number > cardinal number > subjective comment > ?evidential > size > length > height > speed > ?depth > width > weight > temperature > ?wetness > age > shape > color > nationality/origin > material > compound element > NP (Scott 2002:114)

### **Cinque (2005): The universalist perspective**

- Greenberg's Universal 20: 'When any or all of the items (demonstrative, numeral and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.' (cited in Cinque 2005:315)
- Cinque shows that this is incorrect, but still, that only 14 of the 24 logically possible orders of Dem, Num, A, and N are attested, based on a meta-analysis of typological works in this area.
- The claim: precisely these 14 orders are predicted to be possible, given the LCA, various conditions on phrasal movement (e.g. marked/unmarked patterns of piedpiping and stranding), and a single, universal base order Dem > Num > Adj > N (each of these categories sits in the specifier of a functional head; each functional projection must be dominated by an AgrP to host phrasal movement).

### **Comments:**

- Empirically *very* dodgy, especially Scott (see Truswell 2009), but there does appear to be *something* going on here, especially given the typological findings (see also Cinque 1994: his claim, based on Hetzron 1978, is that languages in which A follows N ('NA languages') show mirror-image ordering restrictions among As, compared to AN languages, but that in languages in which some As precede N and others follow N ('ANA languages'), the ordering restrictions are the same as AN languages, suggesting head-movement of N. I believe this has since been shown to be too simplistic, even for French).
- There *is* an argument for the DP-hypothesis here (or the DemP hypothesis, at least), but it is contingent on many other theoretical choices (if you don't buy the theory of phrase structure based on the LCA, for example, the argument is weakened).

- The Universal 20 proposal based on the LCA has come under attack from Abels & Neeleman (2007). In their streamlined alternative, the Dem > Num > Adj > N hierarchy is maintained (Dem must c-command Num, etc.), but it is not clear that there is a necessary commitment to treating these as heads with their own projections: a lot depends on assumptions about which constituents and which landing sites movement involves, and last time I checked, those assumptions weren't made explicit.

## 2.7 The DP Hypothesis Is A Lot Like The NP Hypothesis

- **van Riemsdijk (1998):**

'Take the notion of noun phrase. Until the introduction of functional heads in the eighties, the situation was simple. There was one lexical head, N ( $N^0$ ), and there was one containing phrasal node, NP or  $N^{\max}$ . Endocentricity says that a head N can only exist if it heads an NP, and that an NP does not have an independent existence if it is not headed by N... This is endocentricity in its pure form, and X-bar theory was well-designed to formalize this notion in an adequate way. However, work in the late seventies and early eighties has resulted in the realization that determiners are also head-like. And in the wake of that first step, the number of these so-called functional heads has multiplied. In the nominal domain, in addition to D (for Determiner), we have Q (for Quantifier), K (for Kase (=case)), CLASS (for CLASSifier), and many others...

'...the most distressing aspect, perhaps, is that endocentricity is no longer defined in the way in which it should be. What should be expressed is that endocentricity holds between N and DP, and between V and IP. But not only is this not visible in the choice of category labels, more importantly it is formally inexpressible because there are two projections, the N/V-projection and the D/I-projection, each with their own maximal projection node, NP/VP and DP/IP respectively. Hence, endocentricity holds within each of these, but not for the structure as a whole.' (van Riemsdijk 1998:2-3)

- 'To the extent that we can say anything about the categorial status of D, it is that D is nominal.' (van Riemsdijk 1998:4)
- **Grimshaw (2003):**  
 N: [-V +N] *F0*  
 D: [-V +N] *F1*  
 P: [-V +N] *F2*

- Grimshaw (at least in the widely cited early-90s version) kept a notion of *perfect projection* as well as *extended projection*, so she retained a way of saying that NP was a maximal projection. Riemsdijk objects to this. Instead, a projection may contain one lexical head, but as many functional heads as necessary.
  - Dutch and German Direct Partitive Constructions:
- (15) a. een aantal voorbeelden  
a number examples  
b. drie liter melk  
three litre(s) milk  
c. een snee brood  
a slice bread  
d. die krat bier  
that case beer  
e. een kudde olifanten  
a herd elephants  
f. vijf soorten zoogdieren  
five types mammals
- (16) Compare:
- a. een bus met toeristen  
a bus with tourists  
b. etc.
- (17) Selection:
- a. Zij hebben een schaal gebakjes omgestoten / opgegeten  
they have a tray pastries turned-over eaten-up  
b. Zij hebben een schaal met gebakjes omgestoten / ??opgegeten
- (18) German case:
- a. nach zwei Flaschen rotem Wein  
after two bottles-DAT red-DAT wine-DAT  
b. nach zwei Flaschen roten Weins  
after two bottles-DAT red-GEN wine-DAT
- (19) Distribution of D and Q:
- a. (i) mijn collectie (\*de) Duitse klassieken  
my collection (the) German classics  
(ii) drie kisten (\*25) sigaren  
three boxes (25) cigars  
b. (i) mijn collectie met de Duitse klassieken

(ii) drie kisten met 25 sigaren (elk)

(20) Independence of the two Ns: relative clauses:

- a. een bus toeristen die allemaal dronken waren  
a bus tourists who all drunk were
- b. een bus toeristen die in de sneeuw was blijven steken  
a bus tourists that in the snow had remained stuck
- c. een bus toeristen die allemaal dronken waren die in de sneeuw was  
blijven steken

(21) Independence of the two Ns: adjective orders:

- a. mit einer braunen Kiste grossen Zigarren  
with a brown box big cigars
- b. ??mit einer braunen grossen Kiste vs. mit einer grossen braunen Kiste

#### Comments:

- Riemsdijk dissolves the question ‘What is the head of a noun phrase?’, by denying the uniqueness presupposition.
- From Geoff’s perspective, it’s encouraging that there’s substantial support for the fact that N behaves like a head of the noun phrase.
- But it’s equally interesting that *other* lexical items can do likewise. This suggests that the notion of a single head may not be sustainable. (→ the notion of Relativised Head in Williams 1994?)
- Riemsdijk suggests that there is an argument *a fortiori* that the same nonuniqueness of heads applies to functional heads too. On my skim re-reading, I didn’t see that argument, but it’s certainly a natural proposal.

### 3 General Considerations

- In at least one case, there is no *syntactic* argument for the DP-hypothesis, but there is a semantic argument. To turn that into a syntactic argument we need an assumption:
  - **Relatively uncontroversial:** Heads are functors (certainly holds for anything we would consider to have an argument structure.
  - **Stronger, more controversial:** Functors always project.

If the controversial part were accepted, the DP hypothesis would be clearly correct. But the controversial part is surely too strong (think of the difference between a type e subject and a GQ subject: the latter should project

but not the former, so sentences would be DPs if the subject were a GQ, but TPs if the subject were an ordinary individual). Accordingly, we can't accept such arguments for the DP hypothesis.

- The cartographic evidence suggests that our nominal syntax must be able to capture generalisations and pre-/post-head asymmetries concerning ordering restrictions over nominal elements. Kayne (1994) kickstarted the minimalist study of the asymmetries, and we all know what *his* solution looks like. Abels & Neeleman clearly show that you don't need anything like the full-blown LCA to capture the asymmetries. It appears that they still need a total ordering of Dem, Num, Adj, and N w.r.t. c-command to capture the asymmetries with standard assumptions about movement, which would not be possible within a typical 2-bar-level structure with NP as the only nominal projection: there simply wouldn't be enough levels to differentiate all of those positions.
- The Greek extraction facts do suggest the presence of an A'-position at the left edge of Greek noun phrases. Interestingly, this is related to facts about Greek *nouns*, rather than Greek determiners. Nothing there tells us about the crosslinguistic generality of Horrocks & Stavrou's (1987) proposal.
- As a third way, the proposals based on extended projections have a lot to offer. To my mind, van Riemsdijk (1998), in particular, goes a long way towards showing that asking about *the* head of noun phrases may be presupposing something it shouldn't.

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