Bare NPs and DP-internal number agreement(s)

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1 Introduction

The problem: In many European languages, *bare nouns*, (BN) are impossible when the noun is singular and countable (i.e. *BSCN), but possible (at least in some positions) when it is *plural* (i.e. ✓BPCN) or *mass* (✓BSMN).

(1) a. This is {*(a) table / wine}
     b. Questo e' {*(un) tavolo / vino}

(2) a. I saw {*(a) table / plates / wine} on the table.
     b. Ho visto {*(un) piatto / piatti / vino} sul tavolo.

- Semantically, common nouns are properties just like adjectives. Why is a determiner necessary in (1)?

  Semantic reply: it isn't! It's all syntax (see e.g. Winter 2002)

- Syntactically, mass and count nouns share a common feature for morphological number, here -PLUR. Any syntactic difference between them must appeal to an *ad hoc* (and invisible) 'mass suffix' (see e.g. Delfitto and Schroten 1992, Deprez 2002).

  Pluralia tantum like Italian *occhiali* "spectacles/glasses" show that a purely syntactic mark of plurality is not sufficient to license a bare nominal: a real semantic plurality is needed.

  (3) a. Ieri   per mezz'ora   ho   riparato gli occhiali di Carlo.
           yesterday, for half an hour, I have fixed   the glasses of Carlo
           preferred interpretation: "I fixed one pair of glasses"
       b. Ieri   per mezz'ora   ho   riparato occhiali di Carlo.
           yesterday, for half an hour, I have fixed   glasses of Carlo
           only interpretation: "I fixed multiple pairs of glasses of Carlo's"

  (*Note*: The effect seems to be absent in e.g. "*Gianni portava occhiali con la montatura gialla*", "John wore glasses with a yellow frame". We suggest that here V+BP denote an activity ("glass-wearing"))

The idea in a nutshell:

- The problem of BN is the lack of a feature value on N. Specifically, we propose that a singular determiner is necessary to assign N a value for a semantic feature (LATT in the system of Heycock and Zamparelli 2003) which, combined with the syntactic plurality, determines whether a noun is *used* as mass or count in a particular context.

- *Theoretical consequence:* AGREE can transmit semantic information from one head to another.

- *Corollary:* not all features which start out unvalued are uninterpretable.

2 Factoring the Data

In what circumstances can BS nouns appear (in languages that have indefinite determiners)? Some cases:

(4) a. *John* arrived.   **Proper names / "unique" common nouns**
     b. It's {*bedtime* / *Thursday* / *midnight* / **hour* / **year* / **same time as yesterday*}

(5) a. This is *brown rice*   **Mass and abstract nouns (En.,Ger.)**
     b. *Water* was gently flowing down the stream.
     c. It was *love*

(6) {*Girl* / *Old friend* / *Guys*}, come here!   **Vocatives**

(7) Da/Come *primo ministro*, Silvio ha promosso solo leggi in suo favore.   **"As"-constructions (It.)**
     once/as   prime minister, Silvio has promoted only laws in his interest
     "As/Once a prime minister, Silvio promoted only laws in his own interest"

(8) a. Maurice Adams, formerly *Deputy Director* [...], is now General Manager of Acet.   **Appositions**
     b. The queen of the authors is Harriet Scrope, *novelist*, *plot-stealer*, and *ferocious egotist*, whose war against the world she inhabits extends to her best friend and her cat.

(9) a. [I dati macro rilasciati negli Usa avevano fatto   propendere i più per   un intervento di "soli" 25 punti
         the data macro released in the USA have   made people think   about an action   of "only" 25 point
         base]$_i$, [*fatto* (questo)]$_i$ che aveva permesso al dollaro di recuperare prontamente ...   **Reprise-commentaire**
         base, [fact (this one)] that allowed   the dollar to gain rapidly   ...
         (Anscombre 1986)
         (meaning unchanged with the demonstrative absent)
     b. [La critica   [...] non esalta   particolarmente il "valore letterario" del Futurismo]$_i$, [*opinione* (questa)]$_i$ che
         The critique [...] doesn't praise particularly   the "value literary" of Futurism,   [opinion (this one)] that
         non mi trova d'accordo.
         I don't agree with

(10) Carlo è {*insegnante* / *deputato* / *ministro* / *macellaio* / *dottore in legge* / *comandante di brigata* / ...}   **Profession pred.**
      Carlo is {teacher   / deputy   / minister / butcher   / doctor in law   / commander of brigade / ...}

Note:

- The prohibition against BSC is of a different nature than the Romance restrictions against bare *plural/mass* (no subject/object asymmetries, no heaviness effect).

- Adjectives do not help (*"{Brown / Certain / Other / Best} dog is here").

Can these cases be clustered? Two broad classes:

N-to-D movement ⇒ lack of article licensed by features of D

Proper names (Longobardi 1994): the necessity of an article may be obviated if N (a proper name) moves to D, overtly (Romance) or covertly (English), by substitution. The same would hold for pronouns of category N raised to D (Cardinaletti 1993).

Bare vocatives might also be thought to involve N-to-D raising past possessives, yielding the normally impossible *non contrastive* [N POSS] order:

(11) a. Cane mio, vieni qui!
          Dog my, come here!

      b. Collega mio caro, vieni qui.
          Colleague my dear, come here
          normal order: "Il mio caro collega"

However, vocatives cannot be coordinated with names or pronouns used as vocatives (12), as expected from (13).

(12) a. {You / Girl / Bill}, come here!
　　　 b. You and John, come here!
　　　 c. *{You and girl / John and girl}, come here!

(13) *[[$_{DP}$ John$_i$ ...[NP t_i]] and [$_{DP}$ girl$_i$ ...[NP t_i]]] ...

Predication of a DP argument ⇒ the lack of D is repaired by the DP the noun is a secondary predicate of.

In *as*-constructions and appositions, the BS noun has an anaphoric link with a nominal element, either an overt DP (appositions) or perhaps a PRO ("As"-constructions).

(14) a. Da/Come PRO$_i$ *primo ministro$_i$*, Silvio$_i$ ha promosso solo leggi in suo favore.　　　*"As"-cases, = (7)*
　　　 b. [Maurice Adams]$_i$, [formerly Deputy Director [...]]$_i$, is now General Manager of Acet. *appositions, = (8a)*

Reprise-commentaire and vocatives could perhaps combine movement to a high Spec position and coindexing. In (15a), the BN precedes an optional demonstrative; in (15b), the BN might be a modifier adjoined or in Spec of an empty nominal head.

(15) a. [La critica non esalta il "valore letterario" del Futurismo]$_i$, [*opinione* questa]$_i$ che ... *reprise-comm., (9b)*
　　　 b. [$_{DP}$ [$_{NP}$ girl]$_i$ $ec^{deictic}$ t], [$_{IP}$ come here]

Case (12c) now follows from (15b) under the impossibility of empty categories conjoining with overt ones:

(16) *[[$_{DP}$ John] and [$_{DP}$ girl$_i$ ec_i t]] [$_{IP}$ come here!]

Assumption so far: "modification" entails feature sharing. The missing feature of N is provided by the modified element. But, what is this feature? Second, can this approach extend to *primary* predication – the profession predicates?

3　Masses and plurals

The problem is to find a plausible feature with the same value for singular mass and plural count nouns.

3.1　Common semantic aspects for plurals and masses

Cumulative reference　(Quine 1960) "X is *horses*" and Y is *horses*" ⇒ "X+Y is *horses*"

　　cf. the singular: "X is *a horse* and Y is *a horse*" ⇏ "X+Y is a *horse*"

Divisive reference　(Cheng 1973) "X+Y is *horses*" ⇒ "X is *horses* and Y is *horses*" (modulo singular horses).

　　cf. the singular: "X+Y (together) is *a horse*" ⇏ "X is *a horse* and Y is *a horse*" (X,Y are horse-parts)

"Cumulative" + "Divisive reference" = *homogeneous reference* (Lœnning 1987, Higginbotham 1994).

The same properties hold for *mass nouns*: "half of this water is still water", "water plus water is still water".
⇒ fundamental similarity between the semantics of plurals and that of mass nouns (Link 1983, Lœnning 1987, Pelletier and Schubert 1989, etc.);

Widespread semantic solution: plural/masses denote algebraic *semilattice* structures, (closed under the operations of *meet*, *join* and *complementation*, see e.g. Keenan and Faltz 1985,(Winter 1998)), which have the homogeneous reference property.
Singular count nouns do not denote lattices, but simply sets of singulars. In features: +LATT = denotes a lattice; -LATT = it doesn't.

Advantage: Numerals as restrictive modifiers of pluralized nouns (they crucially intersect +LATT structures: "three horses" = "horses"∩"groups containing 3 atomic objects").

3.2　Evidence for an independent projection for lattice formation.

Does this semantic structure arise at the lexical level? ⇒ No.

Italian: (i) Cardinals can be adjectives (ii) adjective can appear after N (iii) Numerals can appear as predicates (17a) **but** (iv) Numerals cannot appear after N (not even within a relative) (16b,c). Identical facts hold for masses, see *"the water that is much"*

(17) a. I　problemi erano {quattro / molti / troppi}.
　　　　　 the problems were {4　　 / many / too many}
　　　 b. ??Devo　risolvere problemi che siano {quattro / molti / troppi}
　　　　　 I must solve　problems that are　{4　　 / many / too many}
　　　 c. *Ho　　comprato libri　che hai　　letto (che erano) quattro.
　　　　　 (I) have bought　books that you have read (that were)　4

Schwarzschild (2002): evidence from *pseudopartitives* vs. *N-N-compounds*. Subparts of 2 pounds of oil must be less than 2 pounds, while subparts of oil whose temperature is 90 degrees may still be 90 degrees.

(18) a. [2 pounds] of oil.
　　　 b. *[90 degree(s)] of oil.

(19) a. *[2 pound(s)] oil (poured through the hole)
　　　 b. [90 degree] oil (poured through the hole)

⇒ only measure phrases which don't track the part-whole relation (i.e. don't apply to the lattice structure) are acceptable in N-N compounds. This is not due to a syntactic problem with measures in N-N-compounds, see:

(20) [1 pound] rocks　　*plurality scopes over the measure: no meaning "enough rocks to reach a total of 1 pound"*

Solution: lattice denotations do *not* come from the lexicon. They are formed at a functional layer, called PLP, above NP. Pseudopartitives are above, N-N compounds below this layer.

(21) [$_{DP}$ [$_{MP}$ 2 pound] of ... [$_{PlP}$ Pl [$_{NP}$ (*[MP 2 pound]) oil/stones]]]

3.3　Lattice-forming operators

The interaction between N and Pl must: (*i*) keep into account singular and plural morphology (*ii*) distinguish singular masses from singular count nouns, and explain the fact that masses don't take numerals.
This can be achived by distinguishing two native denotations for N: *entities* and *properties*

Semantic proposal:

- Canonical "count" nouns natively denote sets of entities (type $<e,t>$): e.g. "man" denotes the (extensional) set of all men. This denotation can function as a property (a restrictor).

- Canonical "mass" nouns denote entities (type $<e>$); e.g. "water" denotes the largest (contextually salient) amount of water. This denotation cannot directly function as a property (a restrictor).

- Nouns have a semantic bias toward entities or properties, but can be coerced (by *grinding*, *abstraction*, *kind-formation*) to the other:

(22) a. There wasn't much man left in him.　　*count→mass: "man"="man's (physical/moral) substance"*
　　　 b. Cavit makes three best-selling wines　　*mass→count: "wine"= "kind of wine"*

Next, two abstract operators are needed at PlP, one for count (*$_{<}^{<et><ett>>}$) and one for mass nouns ($+_{<}^{<e><ett>>}$). They both apply to the NP denotation

(23) $^{*}[\![P_{<e,t>}]\!]$ = the smallest X such that $[\![P]\!] \subseteq X$ and $\forall Y,Z \in X$ $[Y \cup Z \in X]$
the set of all the possible pluralities formed by grouping together the singularities in P.

(24) $^{+}[\![P_{<e>}]\!]$ = the smallest X such that $\forall Y$ $[Y \leq [\![P]\!]] \wedge C(Y) \rightarrow Y \in X]$
namely, the set of all possible subparts of the entity denoted by P.

($\cup$ is the individual sum operator; $\leq$ the subpart relation between two individuals; **C** a (possibly vague) canonical property which holds of the mass and of every proper subpart).
(24) gives no guarantee that 'smallest atomic elements' always exist for masses. $\Rightarrow$ cardinal numerals cannot combine with them, as desired.
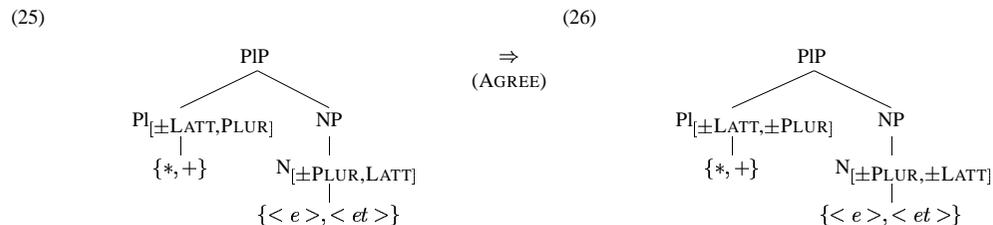
3.4 The role of features

Feature inventory so far:

1.   Feature $\pm$PLUR, on N: indicates whether the morphology is singular or plural;
2.   Feature $\pm$LATT, on Pl: indicates whether a lattice is created or not;
3.   Pl, when +LATT, can create the lattice either by 'multiplying' properties (*) or by 'dividing' ($^{+}$) entities.

This can be recast in a mechanism along the lines of (Chomsky 2001) (see also unification grammars, Shieber 1985), using the distinction between *valued* and *unvalued* features:

- Pl has an *unvalued* PLUR feature and a *valued* LATT feature: +LATT = create a lattice; -LATT = do nothing (the identity function).

- N has an *unvalued* LATT feature and a *valued* PLUR feature: +PLUR = plural morphology; -PLUR = singular morphology.

(25)   (26)

PlP $\Rightarrow$ PlP
                (AGREE)

$Pl_{[\pm LATT, PLUR]}$ NP $Pl_{[\pm LATT, \pm PLUR]}$ NP

$\{*,+\}$ $N_{[\pm PLUR, LATT]}$ $\{*,+\}$ $N_{[\pm PLUR, \pm LATT]}$

$\{<e>,<et>\}$ $\{<e>,<et>\}$

PLUR/LATT values must be shared because certain combinations of values force a change in the denotation of N and of Pl. In particular:

$N_{[-PLUR,-LATT]}$ must denote a property, not an entity (entities cannot be used as restrictors)
    $\Rightarrow$ "water$_{-PLUR,-LATT}$" must be coerced to mean "kind of water"
$Pl_{[-PLUR,+LATT]}$ denotes $^{+}$, $Pl_{[+PLUR,+LATT]}$ denotes *.

Other combinations may be ruled out by economy, if we assume that morphological pluralization is marked: this extra effort is vacuous if Pl_{-LATT}. Only specially marked lexical items (*glasses, brains*) can override this.

3.5 The need for over -Latt assigners

Fundamental asymmetry between +LATT and -LATT at PlP: Pl_{-LATT} has no semantic function.

(27)   **Assumption:** Phonetically empty heads with no semantic content are not merged.

    Corollary: Pl_{-LATT} cannot provide a value for the unvalued N_{LATT}, unless it has some phonological content.

Consequence: an overt -LATT element must be inserted within N's agreement domain, to provide this value. This is normally a determiner, but can also be a full DP (in appositions) or an empty category coindexed with a DP (in "As"-constructions and perhaps vocatives).

How the system works: some examples

(28)
a. $[_{PlP}$ Pl$^{*}_{[+LATT]}$ $[_{NP}$ **boys**$_{[+PLUR,LATT=\emptyset]}]]$ *plural: +*LATT *to N from Pl**
b. $[_{PlP}$ Pl$^{+}_{[+LATT]}$ $[_{NP}$ **water**$_{[-PLUR,LATT=\emptyset]}]]$ *mass: +*LATT *to N from Pl**
c. $^{*}[_{PlP}$ Pl$_{[-LATT]}$ $[_{NP}$ **boy**$_{[-PLUR,LATT=\emptyset]}]]$ *violates (27) (empty Pl with no content)*
d. $^{*}[_{PlP}$ Pl$_{[-LATT]}$ $[_{NP}$ **glasses**$_{[+PLUR,LATT=\emptyset]}]]$ *violates (27) (empty Pl with no content)*
e. $^{*}[_{NP}$ **boy**$_{[-PLUR,LATT=\emptyset]}]$ *no PlP:* LATT *of "boys" remnains unvalued*
f. $^{*}[_{NP}$ **glasses**$_{[+PLUR,LATT=\emptyset]}]$ *no PLP:* LATT *of "glasses" remains unvalued*

Overt singular determiners to the rescue (we assume "a" to head PLP in English, "the" outside, see Heycock and Zamparelli 2003)

(29)
a. $[_{PlP}$ **a**$_{[-LATT]}$ $[_{NP}$ **boy**$_{[-PLUR,LATT=\emptyset]}]]$ *sing-count: -*LATT *to N from "a"*
b.   **the**$_{[-LATT]}$ $[_{NP}$ **glasses**$_{[+PLUR,LATT=\emptyset]}]$ *sing-count: -*LATT *to N from "the"*

4 The "profession predicates"

Bare profession predicates should be cases of predication: LATT values should be provided by some feature of the subject DP (no analogous effect with *there*-sentences).

(30)   C'   e' *(un) {professore / insegnante / ministro}
         there is (a)   {professor / teacher   / minister}

However, there normally no syntactic gender/number feature sharing between subject and predicate nominal.

(31)
a.   Quelle   donne   sono un   problema
          those$_{pl,fem}$ women$_{pl,fem}$ are a$_{sing,masc}$ problem$_{sing,masc}$
b.   be $[_{SC}$ $[_{DP}$ those women]$[$(Pred)DP a problem$]]$
c. *be $[_{SC}$ $[_{DP}$ that thing]$[$(Pred)DP problem$_{[Latt=\emptyset]}]]$

Questions: (i) How to characterize the class of nominal predicates which can be bare? (ii) What kind of licensing is involved?

Professions, but also other relations.

(32)
a.   Carlo è {*cugino* di Francesca / *genero*   di Marco}
          Carlo is {cousin of Francesca / brother-in-law of Marco}
b.   Maria è vicina di casa   di Carla.
          Maria is next-door neighbor of Carla

Failure of modification, in cases such as:

(33)   Carlo e' *(un) {medico italiano / anziano professore}
          Carlo is (a)   {doctor italian / old   professor}

Pollock (1983) $\Rightarrow$ Profession nouns are *adjectives*
Kupferman (1991) $\Rightarrow$ Syntactically, they do not behave as adjectives. E.g. no *en* cliticization with bare nouns.

(34)
a.   Paul est {satisfait / directeur} de ce   collège
          Paul is {satisfied / director}   of this college

b. Paul en est {satisfait / *directeur}
   Paul of_it is {satisfied / director}

Moreover, some modifications are still possible:

(35) a. Maria è infermiera diplomata.
        Maria is nurse licensed$_{fem,sing}$
     b. Petrarca divenne poeta laureato
        Petrarca became poet laureate$_{masc,sing}$

Kupferman's proposal: these nouns are *eventive*. Munn and Schmitt (2002): they have an *event argument* which theta-marks the subject in an internal NP position (below the position normally occupied by the article).

Problems: (*i*) The notion of *eventive argument* has no intuitive content when applied to cases such as (32); (*ii*) Clear eventive nominal (e.g. *arrivo* "arrival", *nascita* "birth") always need a determiner; (*iii*) no account of why the same shouldn't be possible in English.

Alternative intuition:

"Profession nouns" (e.g. *insegnante*, "teacher") are ambiguous between two meanings. The first (**teacher**[1]), requires a determiner and can be semantically characterized as the extension of the sortal noun "teacher" (the set of people who happen to be teachers in the present world). It is not different from *dog* or *person*.
The second meaning, (**teacher**[2]) (the one which, descriptively, doesn't always require a determiner) has a thematic relation between the noun and its external argument. Formal semantics might attempt to characterize it in terms of sets of *possible arguments* to the predicate "teach something".

The two meanings differ in abstractness, and this reflects in their features. **teacher**[1] has the syntactic features of a normal common noun (i.e. [±PLUR,±FEM,LATT], where ±FEM marks gender and LATT is unspecified. **teacher**[2] is unvalued for gender features.
Unlike other nouns, "profession nouns" (in the abstract interpretation) require syntactic agreement in gender across a copula.

(36) a. Letizia Moratti$_i$ è ministro$_{masc}$ della Pubblica Istruzione.
        Letizia Moratti$_{fem}$ is minister$_{masc}$ of Education
     b. Letizia Moratti$_{fem}$ è (una) {cugina di Carla / professoressa}
        Letizia Moratti$_{fem}$ is a$_{fem}$ {cousin$_{fem}$ of Carla / professor$_{fem}$}

(37) a. Il ministro$_i$ è {una cugina di Carla / professoressa$_{fem}$}
        the minister$_{masc}$ is {a$_{fem}$ cousin$_{fem}$ of Carla / professor$_{fem}$}
     b. *Il ministro$_i$ è {cugina di Carla / professoressa}
        the minister$_{masc}$ is cousin$_{fem}$ of Carla / professor$_{fem}$}

Bare predicates don't conjoin easily with non-bare ones:

(38) ??Carlo è avvocato e un professore.
     Carlo is lawyer and a professor

Proposal: The subject of copular sentences with "profession nouns" comes from a more internal position in the DP. This position (possibly the Spec of a Gender-related FP) allows theta-marking by N and syntactic feature sharing between subject and predicate (39).

(39) [$_{DP[-LATT,-FEM]}$ Gianni]$_i$ è [$_{FP}$ t_i [$_{NP}$ insegnante$_{[FEM,LATT]}$]]

The same structure doesn't apply to English (no syntactic gender), and to those Ns that have a gender feature specified from the lexicon.

5 Conclusions

- The most plausible syntactic feature common to mass and plural is *semantic plurality* (+LATT)
- LATT is initially unspecified on N. -LATT can be obtained from an overt D or by agreement/predication with a DP$_{[-LATT]}$
- The combination of the two features LATT/PLUR generates singular and plural count, mass nouns and *pluralia tantum*.
- LATT on N is a feature which starts out unvalued, and acquires a value via AGREE or feature unification. The result has semantic consequences ⇒ (*i*) not all unvalued feature are uninterpretable, or crash at PF.

Some open issues]

- European vs. Brasilian Portuguese (✓ argumental BSCN, *predicative ones (Munn and Schmitt 2002))
- article-free languages in general.
- Kind-denoting bare plural/mass nouns.
- Subkinds vs. object denotation of nouns.

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