Universität Potsdam
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MM3 Cross-Linguistic Semantics
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5 – Nouns and Numbers

1. Introduction

1.1 Count and Mass Nouns in German/ English

(1) a. Haus - Häuser

b. Sand - #Sände, Butter - *Bütter, Gold – *Gölde/Gölder

(2) a. Johann hat *(ein) Haus gekauft.

b. Johann hat (*ein) Häuser gekauft.

c. Johann hat (*ein/*einen) Gold/ Sand gekauft.

→ plural inflection only with count nouns

→ indefinite articles only with singular count nouns, but not with plural and mass nouns.

Q1: What is the denotation of plural and mass nouns?

Q2: What is the semantic effect of plural morphology?

(3) [[Jungen]] = ???

1.2 The classical view: Link (1983)

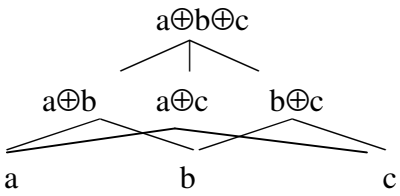
i. plural count nouns N_{Pl} denote lattice-structures built from minimal atomic elements (= the denotation of the singular count noun N_{Sg}).

→ plural formation operates over these atomic elements: $[\![N_{Pl}]\!] = [\![Pl]\!]([\![N_{sg}]\!])$

(4) a. $[\![\text{Junge}]\!] = \{a, b, c\} = P$

b. $[\![\text{Jungen}]\!] = \{a, b, c, a⊕b, a⊕c, b⊕c, a⊕b⊕c\} = *P$

c.



d. $[\![Pl]\!]_{Link} = \lambda P_{<et>}.\ \wp(P) - \varnothing$

ii. mass nouns denote plural-like lattice-structures *without* minimal atomic elements, hence no morphological plural formation is possible;

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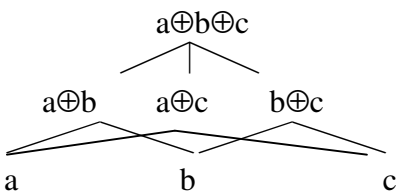


… … … … … …

→ the parallel semantic structure of plural and mass nouns accounts for the fact that the two kinds of expressions share two semantic properties (Krifka 1989):

(6) i. Divisibility: Any two parts of a plurality or mass satisfying *P form again an instance of *P.

→ parts of coffee/boys are coffee boys

ii. Cumulativity: Any two pluralities satisfying *P form again an instance of *P.

→ any two portions of coffee/ groups of boys are boys.

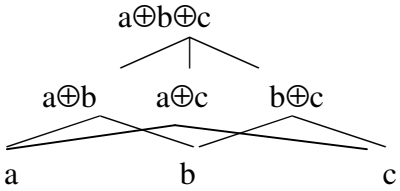
2. Mass Nouns and Plurals from a Cross-Linguistic Perspective: Chierchia (1998)

- *Core Assumptions:*

i. the denotations of mass nouns are built from atomic minimal parts too.

ii. mass noun denotations form complete join atomic semi-lattices: they contain both the atomic parts and the collections built from these parts and are hence *number-neutral*:

(7)



with a, b, c atomic minimal portions of gold/ sand/ water etc.

iii. count nouns are singular: their denotations contain only the atomic minimal parts.

b. $[\![\text{Junge}]\!]_{\text{Chierchia}} = [\![\text{Junge}]\!]_{\text{Link}} = \{a, b, c\}$

iv. plural count noun denotations contain only the plural groups formed from these atoms.

c. $[\![\text{Jungen}]\!]_{\text{Chierchia}} = \{a⊕b, a⊕c, b⊕c, a⊕b⊕c\}$

v. The semantics of plural formation:

(8) $[\![\text{Pl}]\!]_{\text{Chierchia}} = \lambda P_{<et>}. *P - P = [\![\text{Pl}]\!]_{\text{Link}} - P$

vi. Mass nouns cannot be pluralized since their denotation already contains plural collections.

(9) i. mass nouns: number-neutral (atoms and groups in denotation)

ii. count nouns: sg. or pl. denotation

vii. The semantic type of lexical Ns/NPs is subject to cross-linguistic variation:

- <e> : kind/mass (no Dets) → Mandarin, Thai; or
- <et> : predicate (argument DPs always with Det) → French, Italian; or
- <e> and <et> : kind (*water*)/ predicate (*boy(s)*) → English, German

(10) i. Mandarin/Thai: [+arg, -pred]
- The extension of all nouns is mass (<e>)
- No plural marking
- Numeral classifiers obligatory for counting
- Generalized bare arguments

ii. English/German: - Count/mass distinction: <et> vs. <e>
[+arg, +pred] - Count nouns: plural marking
- mass nouns: classifiers or measure constructions
- only mass nouns can be bare arguments

3. A Prediction and Dene Supine: Wilhelm (2008)

3.1 Chierchia's prediction

Number inflection and numeral classifiers should be in complementary distribution cross-linguistically

3.2 The Dene System

- *Central Observations*

i. Dene has generalized bare arguments: no overt determiners

(11) a. k'ásba nághıłnígh.
chicken perf-1sgS-buy O
'I bought a chicken.'

b. dzé héłnágh
gum perf-swallow
'He swallowed the gum.'

ii. No nominal number inflection on N, but plurality and distributive suffixes on V:

(12) a. tth'áy thıłtsı̨ sı̨
dish perf-1sgS-make sg O perf assert
'I made a (one) dish.'

b. tth'áy ghıghą sı̨
dish perf-1sgS-make pl O perf assert
'I made several dishes.'

iii. No classifiers: Numerals combine directly with N

(13) solághe k'ásba
five chicken
'five chickens'

→ Dene has generalized bare arguments and no nominal number, but no classifiers.

iv. Some nouns are incompatible with numerals and require a measure expression:

(14) a. #five milk b. five cartons of milk / five milk cartons

(15) a. mass-like nouns: coffee, wine, beer, salt, sugar, hunger, sleep

b. count-like nouns: stone, pipe, rope, house, mosquito

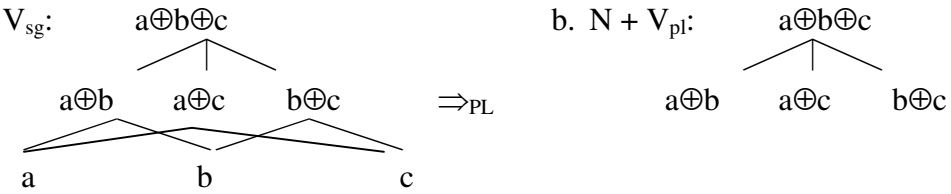
→ only count-like nouns can occur with plural marking on V

- *The proposal*

i. All generalized bare arguments in Dene (and possibly in Thai and Mandarin as well) are number neutral, but differ in whether or not they contain atomic subparts.

ii. pluralization (marked on V) in Dene can only affect count Ns with atomic subparts and consists in filtering out the this atomic bottom layer from the denotation.

(16) a. $N + V_{sg}$: b. $N + V_{pl}$:



b. $[\![\text{Pl}]\!]_{\text{Dene}} = \lambda P_{<et>}.\ {}^{*}P - At$ (= Link's proper pluralities ${}^{\star}P$)

- *Interim Summary*

i. Dene generalized bare arguments are number-neutral, but come in two different types

ii. Dene bare arguments show a count/mass distinction (reflected by number on V)

iii. the count/mass distinction is best captured in terms of atomicity = Link 1983

iv. Count nouns can be pluralized by filtering out the atoms from the number-neutral denotation, cf. also Martí (2008) for a related claim on Brazilian Portuguese

- *The role of numerals in English/Dene* vs. *Mandarin*

i. In English and Dene, numerals have an atom-accessing function OU, which can only apply to noun denotations containing atomic subparts, i.e. count nouns.

ii. If applicable, OU specifies the cardinality/number of object units in the denotation of the numeral-modified NP (cf. Hoeksema 1983) = modifying use of numeral

(17) English *three* / Dene *taghe* 'three'

$[\![\text{three / taghe}]\!] = \lambda P_{<et>}.\ \lambda x_e.\ [P(x) \ \&\ OU(x) = 3]$ (OU = cardinality function)

iii. The real difference between generalized bare argument languages of the Mandarin and Dene type is located in the numeral. Mandarin numerals have no atom-accessing function and therefore require the need of an additional classifier that does the job.

(18) a. $[\![\text{ge 'unit'}]\!] = \lambda n.\ \lambda P_{<et>}.\ \lambda x_e.\ [P(x) \ \&\ OU(x) = n]$

b. $[\![\text{san 'three'}]\!] = 3$

c. $[\![\text{san ge 'three unit'}]\!] = \lambda P_{<et>}.\ \lambda x_e.\ [P(x) \ \&\ OU(x) = 3] = [\![\text{three / taghe}]\!]$

3.4 Revised Typology: A three-way classification

	I: number inflection	**II: numeral classifiers**	**III: bare nouns**
Nouns:	sg vs. pl	number-neutral	number-neutral
Numerals:	OU function	no OU function	OU function
Example:	English	Mandarin	Dene

→ cross-linguistic variation in the functional inventory (numerals) of languages, but also in the meaning of the basic lexical category N.

4. Refining the typology

Closer inspection shows that the class of Sg/Pl languages also divides into two further subtypes as the denotation of singular and plural Ns differs across languages:

(19) a. *two dog vs. two dogs [English: NUMs >1 incompatible with N_{Sg}]

b. one dog

(20) a. kàtiifàa huɗu vs. kàtìifuu huɗu [Hausa: NUMs >1 compatible with N_{Sg}]
mattress.SG four mattress.PL four
'four mattress*es*' 'four mattresses'

b. yaaròo *ɗaya*
boy one
'one boy'

Q1: What would the denotation of N_{Sg} and N_{Pl} have to be in order to account for the relevant facts?

Q2: How do these N-denotations differ from their English counterparts?

Q3: What is the semantic effect of plural number marking on N in Hausa?

5. A Word on Kiowa (Oklahoma)

- Number systems in natural languages may be even more complex and involve more than the two parameters [+/- DIV] (mass & $count_{PL}$ vs. $count_{Sg}$) and [+/- Atom] ($count_{PL/SG}$ vs. mass)

(21) [+/- augmented], [+/- singular], [+/- group] [Harbour 2008]
≈[+/- DIV] ≈[+/- Atom] ≈[+/- salient subparts]

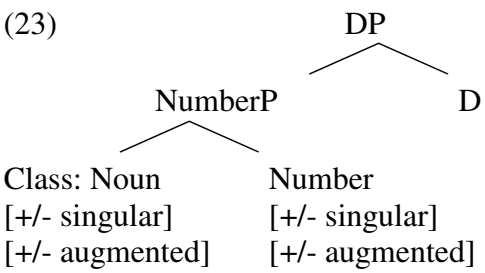
(22) The system without [group]

referential cardinality	[+/- singular]	[+/- augmented]	Agreement type
1	+	-	S(ingular)
2	-	-	D(ual)
3	-	+	P(lural)

- Number marking inside the DP and inverse marking on D

→ (partial) feature specifications are doubly encoded on N and Num and checked against the corresponding un-interpretable features on D, cf. (24):

(23)



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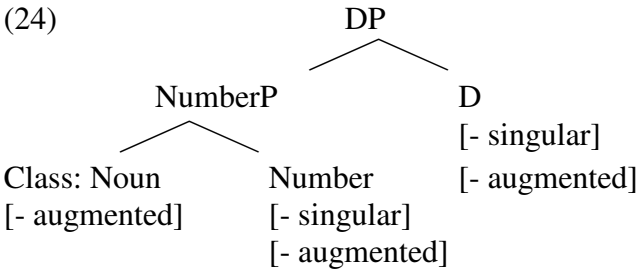
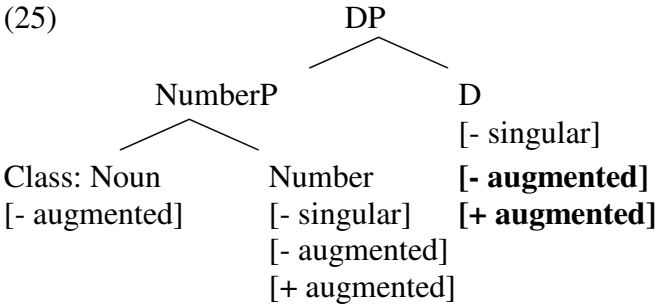


→ Inverse agreement expresses the marked case that contradictory feature specifications survive in D:

(25)



(26) ex. 'fish' with referential cardinality of more than 2

i. lexical N: [- augmented] → no fish subparts
ii. Num: [+augmented → fishes subparts

- # of Lexical Noun Classes in Kiowa: 9

(30)

i.	SII	[+singular]	1st person 'I'
ii.	SDI	[-augmented]	animates, and motion inanimates child, Apache man, wife, bird, moon, axe, body parts
iii.	IDP	[-singular]	plants, man-made objects 'pencil'
iv.	IDI	[-singular –augmented (+group)]	hair and fruit: 'tomato', 'eyebrow'
v.	IDS	[-singular +group]	plants, man-made objects 'tree'
vi.	SDS	[+group]	'river', 'cloud'
vii.	PPP	[+augmented –group]	pluralia tantum, composite nouns; 'trousers'
viii.	SDP	∅	'shoe'

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