

Universal Monotonicity induces non-Universal Grinding

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Overview Cross-linguistically, measurement constructions (MCs) are sometimes sensitive to the internal algebraic structure of an individual and syntax is responsible for this. For example, in English, pseudo-partitives take mass nouns, which denotes individuals with a part-whole structure and measure modifiers take singular count nouns, which doesn't. Here, DP-syntax and semantics of count-mass converge. Similar distinction is also made in Japanese, despite this language lacks apparent morpho-syntactic count-mass marking. In this presentation, I argue that Japanese has both lexical and syntactic count-mass distinction and makes the same distinction which many European languages make. This suggests that monotonicity is a possible universal in the syntax-semantics interface.

Introduction *Monotonicity* is a property of measure phrases (MPs) such that the measurement of something traces a part whole-relation of it (Schwarzschild 2002, 2005). He shows monotonicity predicts the syntactic distribution of MPs in English: pseudo-partitives require monotonic MP as in (1), though measure modifiers require non-monotonic MP as in (2).

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| (1) Monotonic measure phrase 'litre(s)'
a. pseudo partitive: 2 litres of oil
b. measure compound: *2 litre-oil | (2) Non-monotonic measure phrase 'degree'
a. pseudo partitive: *2 degrees of oil
b. measure compound: 2 degree-oil |
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Litre-measurement is monotonic, in a sense that part of a portion of oil necessarily has smaller litre amount. However, degree-measurement is non-monotonic, in a sense that part of a portion of oil don't need to have lower degree. To be monotonic, an individual need to have a part-whole structure. So, pseudo-partitives allow either mass nouns or plural count nouns, and measure modifiers allow only singular count nouns. In many languages, this difference in monotonicity is syntactically marked (Schwarzschild 2002, 2006). For example, in Swiss German and Russian, *MP-NP* configuration is used for monotonic construction and adjectival suffix is attached to MP in non-monotonic ones, i.e., *MP-adj-NP*. Spanish and Romanian use *MP-P-NP* configuration for monotonic measurement and use its reverse order *NP-P-MP* for non-monotonic one (Schwarzschild 2002, 2006, Cornilescu 2009). Though strategies differ, they make monotonicity distinction in syntax, not in lexicon or pragmatics.

Argument Seemingly, Japanese lacks count-mass distinction because (i) it lacks contrast between singular and plural, (ii) its nouns do not require determiners, and (iii) numerals can modify every noun if it accompanies the appropriate classifiers (CLs). However, sometimes the same noun gives rise to a different reading in different syntactic environments. The combination of the classifier '-kg' (CL_{kilo_gram}) and the noun 'uma' (horse) illustrates it.

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| (3) 650kg -no uma (<i>prenominal</i>)
650-CL _{kilo_gram} -Gen horse
a. 'a 650kg horse' (individual)
b. ?'650kg of horse' (stuff) | (4) uma 650kg (<i>postnominal</i>)
horse 650-CL _{kilo_gram}
a. *'a 650kg horse' (individual)
b. '650kg of horse' (stuff) |
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(3) involves a numeral quantifier that precedes the NP (**prenominal NQ**) and (4) involves the one which follows it (**postnominal NQ**). This is not the case that this syntactic environment is fully responsible for this difference. The noun 'biiru' (beer) has no contrast.

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| (5) 2 rittoru-no biiru
2-CL _{litre} -Gen beer
a. 'a glass of beer that is 2 litres' (individual)
b. '2 litres of beer' | (6) biiru 2 rittoru
beer 2 CL _{litre}
a. 'a glass of beer that is 2 litres' (individual)
b. '2 litres of beer' |
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So, nouns like ‘uma’ (horse) and nouns like ‘biiru’ (beer) need to be lexically distinct, which exactly is count-mass distinction. So, Japanese nouns are divided into count and mass, just like English.

The difference in postnominal NQ and prenominal NQs are that the former is a monotonic construction and the latter is non-monotonic construction.

- (7) Monotonic MC ‘-rittoru’ (CL_{litre}):
- a. san-rittoru-no wain (prenominal)
3-CL_{litre}-Gen wine
‘three litres of wine’
 - b. wain-san-rittoru (postnominal)
wine-3-CL_{litre}
‘three litres of wine’

- (8) Non-monotonic MC ‘-do’ (CL_{degree}):
- a. gojuu-do-no abura (prenominal)
50-CL_{degree}-Gen oil
‘50°C oil’
 - b. *abura-gojuu-do (postnominal)
oil-50-CL_{degree}
‘50°C oil’

However, the parallelism is incomplete: the monotonic CLs can occur in the prenominal position in (7a). Still, prenominal NQs have non-monotonic semantics. Prenominal NQs are compatible with the group noun ‘chiimu’ (team), whereas postnominal NQs are not (in an out-of-blue context).

- (9)a. prenominal ‘-nin’ (CL_{person}):
- 3-nin-no chiimu
3-CL_{person} Gen team
‘a team composed of three members’

- b. postnominal ‘-nin’ (CL_{person}):
- *chiimu 3-nin
team 3-CL_{person}
‘a team composed of three members’

As a team has no part-whole structure for ‘nin’ (CL_{person}), (9b) is bad. However, (9a) is fine: it attributes a property of containing three persons to a team.

Proposal First, I propose that prenominal NQs are non-monotonic modifier, whereas postnominal NQs are monotonic measure phrase. I propose following entries for them, e.g., ‘-kg’ (CL_{Kilo Gram}):

- (10)a. Prenominal: $[[[-\text{KGG}]] = \lambda n \lambda x. [\mu_{\text{Kilo Gram}}(x) = n]$
b. Postnominal: $[[[-\text{KGG}]] = \lambda P \lambda n \lambda x: \text{Mon}(P)(\mu_{\text{Kilo Gram}}). [P(x) \ \& \ \mu_{\text{Kilo Gram}}(x) = n]$

The presupposition ‘Mon(P)(μ)’ indicates that the measure function μ is monotonic with respect to the predicate P. Now, this explains the count-to-mass shift in (4). To satisfy ‘Mon(P)(μ)’, P need to denote an individual which has a part-whole structure. However, singular count ‘horse’ do not have an internal structure, in a sense that no part of a horse is a horse. On the other hand, mass coerced ‘horse’ has the part-whole structure because part of horse material is also horse material and this I recursively so. Thus, to avoid violating the monotonicity presupposition, the count noun ‘uma’ (horse) is coerced into a mass predicate so that it feed a part-whole structure for the measure function $\mu_{\text{Kilo Gram}}$. Monotonicity requirement alone is, however, insufficient to account for the absence of coercion in (5) because it’s not the case that non-monotonicity induces a mass-to-count shift. So, Japanese need to have count-mass distinction, just like English.

Conclusion Monotonicity is a property of measurement and many languages, e.g., English, Swiss German, Russian, Spanish, Romanian, distinguish monotonic measurement and non-monotonic measurement in syntax. Though Japanese is typologically remote from those languages, Japanese has the same distinction in its syntax. This makes syntactic environments which differ in monotonicity and this is responsible for count-to-mass shift in Japanese. The fact that this shift only applies to countable nouns suggests that Japanese distinguish count nouns and mass nouns in lexicon. So, count-mass distinction and monotonicity is strongly connected and this is the case in many languages. If this argument on the right track, monotonicity is a possible universal in the syntax-semantics interface, which shed light on the architecture of the linguistic competence of human beings.