

Inclusive plurals and the theory of number Luisa Martí, QMUL

Two recent approaches to the semantics of morphologically plural count nouns are the ambiguity approach (Farkas and de Swart 2010 (F&deS), Grimm 2012: morphologically plural nouns are ambiguous between number-neutral and non-atomic denotations), and the non-ambiguity approach (Sauerland 2003, Sauerland *et al.* 2005, Spector 2007: morphologically plural nouns are unambiguously number-neutral and non-atomic interpretations arise via presupposition or implicature). I provide a new argument for ambiguity and propose that English plural forms on their number-neutral interpretation are the morphological reflex of general number.

A theory of number. Harbour (H) (2011, 2014) uses (1), the features in (2), and (3) to generate the cross-linguistic typology of nominal number distinctions (see Corbett 2000) (Q a free variable, \sqcup the join operator, \sqsubset the proper subpart relation):

- (1)
- (2) $\llbracket +\text{atomic} \rrbracket = \lambda x. \text{atom}(x)$ $\llbracket \pm\text{at} \rrbracket$
 $\llbracket -\text{atomic} \rrbracket = \lambda x. \neg \text{atom}(x)$
 $\llbracket +\text{minimal} \rrbracket = \lambda P \lambda x: P(x). \neg \exists y P(y) \& y \sqsubset x$ $\llbracket \pm\text{min} \rrbracket$
 $\llbracket -\text{minimal} \rrbracket = \lambda P \lambda x: P(x). \exists y P(y) \& y \sqsubset x$
 $\llbracket +\text{additive} \rrbracket = \lambda P \lambda x: Q(x) \& Q \sqsubset P. \forall y Q(y) \rightarrow Q(x \sqcup y)$ $\llbracket \pm\text{add} \rrbracket$
 $\llbracket -\text{additive} \rrbracket = \lambda P \lambda x: Q(x) \& Q \sqsubset P. \neg \forall y Q(y) \rightarrow Q(x \sqcup y)$

- (3) a. Activation of Num⁰: $\llbracket \pm\text{add} \rrbracket / \llbracket \pm\text{min} \rrbracket / \llbracket \pm\text{at} \rrbracket$ is (not) a feature in Num⁰
 b. Feature recursion: it is (not) possible to repeat a feature in Num⁰

n⁰ structures roots into join-semilattices (Link 1983). The features in (2) operate on them. $\llbracket \pm\text{At} \rrbracket$ derives singular-plural systems (singular form= $\llbracket +\text{at} \rrbracket$, plural form= $\llbracket -\text{at} \rrbracket$). $\llbracket \pm\text{Min} \rrbracket$ derives minimal-augmented systems (H 2011, Noyer 1992). Features may combine or repeat ((3)b). $\llbracket \pm\text{Min}, \pm\text{at} \rrbracket$ is for singular-dual-plural: importantly for what follows, dual= $\llbracket +\text{min} \rrbracket(\llbracket -\text{at} \rrbracket(P))$ (singular= $\llbracket +\text{min} \rrbracket(\llbracket +\text{at} \rrbracket(P))$, plural= $\llbracket -\text{min} \rrbracket(\llbracket -\text{at} \rrbracket(P))$, and $\llbracket -\text{min} \rrbracket(\llbracket +\text{at} \rrbracket(P))$, given (2)). $\llbracket \pm\text{Min}, \pm\text{at} \rrbracket$ with $\llbracket \pm\text{min} \rrbracket$ repeatable is a singular-dual-trial-plural system (trial= $\llbracket +\text{min} \rrbracket(\llbracket -\text{min} \rrbracket(\llbracket -\text{at} \rrbracket(P)))$), other numbers as before, remaining combinations ill-formed). $\llbracket \pm\text{add} \rrbracket$ derives approximative number (e.g., paucals)(with additional assumptions not discussed here). H derives all and only the cross-linguistically attested nominal number systems on principled and parsimonious grounds without using primitives such as [dual], [trial] or [paucal].

A problem for H (and others). In many languages, morphologically plural, $\llbracket -\text{at} \rrbracket$ nouns seem to include atoms in downward-entailing contexts (and questions):

- (4) I don't have **children** (neither one nor more children; inclusive)
 (5) If you have **children**, you qualify for benefits (just one child is enough; inclusive)

The non-ambiguity approaches above assume that these plurals are inclusive (i.e., include both atoms and non-atoms) instead of $\llbracket -\text{at} \rrbracket$, i.e., that English nouns use $\llbracket +\text{at} \rrbracket$ (for singular nouns) but not $\llbracket -\text{at} \rrbracket$ (implementations vary). Assuming that $\llbracket +\text{at} \rrbracket$ by itself is a possible number system for nouns, however, will not do. $\llbracket -\text{At} \rrbracket$ is involved in the generation of other numbers, such as dual, trial, or paucal, so these non-ambiguity approaches predict that languages with such numbers should not have inclusive plurals. Slovenian has well-established singular-dual-plural on nouns (Herrity 2016, a.o.), i.e., it is $\llbracket \pm\text{min}, \pm\text{at} \rrbracket$ without repetition of features. $\llbracket +\text{min} \rrbracket(\llbracket -\text{at} \rrbracket(P))$ is necessary to generate the dual (Dvorak and Sauerland 2006 (D&S) argue that their [dual] primitive for Slovenian is presuppositional, not assertive, contra H. More on D&S below). Slovenian, however, has inclusive plurals (own fieldwork):

- (6) Nimam **konjev**
 NEG.have.1P horse.GEN.PL.MASC
 'I don't have horses' (neither one nor more horses; inclusive)

(7) Vsaka hiša ki ima **okna** s pogledom na morje je precenjena
 every house which has window.ACC.PL.NEUT...
 'Every house which has windows with a view of the sea is overpriced' (inclusive)

A solution. I propose that languages with inclusive plurals use [\pm at], with H. In addition, they spell out the inactivation of all features in Num⁰ ((3)a) with the plural form. This is a version of the ambiguity approach in which inclusive plurals instantiate general number—a number category some languages mark morphologically and which indicates number neutrality (Bayso, the Fouta Jalon dialect of Fula; Corbett). (3)a already allows a language not to ever activate any feature in Num⁰ (Pirahã, Everett 1986; Chinese, Rullmann and You 2006 (R&Y); Dëne, Wilhelm 2008). The innovation is that even languages that allow activation of features in Num⁰, and hence make number distinctions, may also choose to have them all inactive. With no activation in Num⁰, no feature acts on the n⁰-provided semilattice and number neutrality results (cf. R&Y). Bayso and Fouta Jalon Fula make number distinctions in addition to general number, so this innovation is necessary anyway. Thus, English and similar languages mark the inactivation of features in Num⁰ with a form, the plural, that they also use for [-at]. The proposal correctly predicts that inclusive plurals are possible in languages with dual nouns (or any other number based on [-at])(if Slovenian has general number realized via plural forms, then it should use them, not the dual, when number is not at stake, which explains many of D&S's examples). In addition, it correctly predicts that there should be languages where it is morphologically *singular* nouns that spell out inactive Num⁰ (contra Sauerland 2008). Indeed, Turkish (Bliss 2003, Görgülü 2015) and Brazilian Portuguese (Schmitt and Munn 1999, Müller 2002) singular noun forms are semantically singular or number-neutral, and plural noun forms are always semantically plural, even in (4)/(5). For F&deS, English singular nouns are not [+at]; their account of singularity is thus incompatible with H.

Distribution of exclusive and inclusive forms. However, we *can* appeal to F&deS in their use of the Strongest Meaning Hypothesis (SMH) (Sauerland and collaborators, and Spector, also do, but implementations vary). In upward-entailing contexts, the [-at]/exclusive meaning entails the number-neutral/inclusive one and is strongest—*There are children in the house* is usually about a plurality of children. In downward-entailing contexts, it is the inclusive meaning that is strongest. As predicted, (7) contrasts with its minimal pair 'Ena hiša...' 'A/one house...', with the exclusive reading of *okna* 'windows' and no longer a downward-entailing context. Also predicted is that SMH applies to singular noun forms in Turkish or Brazilian Portuguese. With singular noun forms ambiguous, number neutrality entails [+at] in downward-entailing contexts and is the meaning that prevails, as in the Brazilian Portuguese (8); cf. (9), not subject to the SMH, since plural noun forms denote only pluralities (refs above, own fieldwork):

(8) Eu não tenho **filho** para cuidar (9) Eu não tenho **filhos** para cuidar
 I not have child to take.care.of I not have children to...
 'I don't have children to take care of' 'I don't have pluralities of children...'

As the SMH also predicts, there are cases (e.g., incomplete knowledge) where the strongest upward-entailing statement the speaker can make is inclusive (F&deS for English plural forms)—the same happens with the positive version of (8).

Selected references Corbett *Number* CUP | D&S FASL 14 | F&deS *Sem&Prag* 3 | Görgülü ms., Simon Fraser | Grimm NELS 41 | H 11 *Morphology* 21 | H 14 *Language* 90 | Müller D.E.L.T.A 18 | R&Y in *Where semantics meets pragmatics* | Sauerland 03 SALT 13 | Wilhelm NaLS 16