The (un)markedness of plural number

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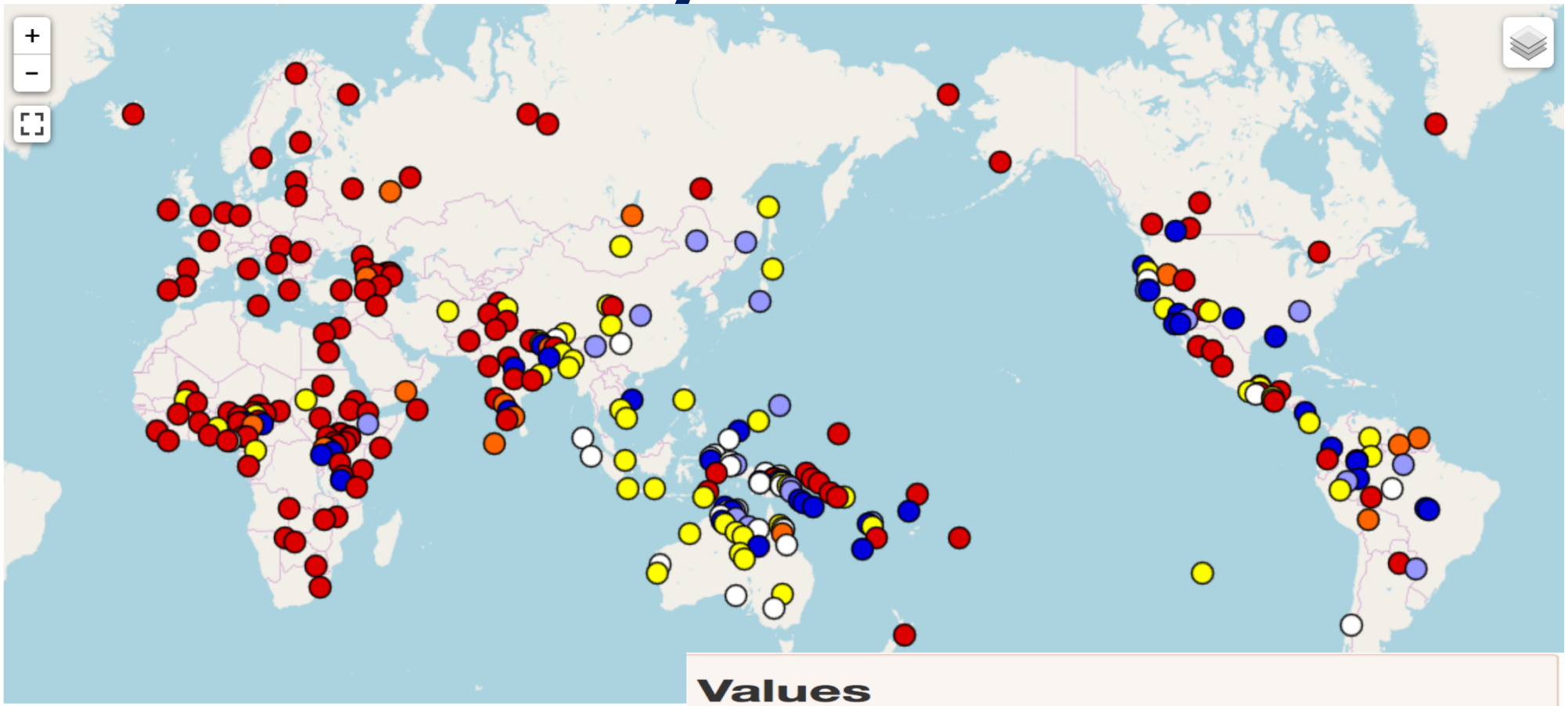
The importance of number

Jespersen (1924: 283): ”Number might appear to be one of the simplest natural categories. Yet on closer inspection it presents **a great many difficulties, both logical and linguistic**.”

Corbett (2000: 1): ”Number is the most underestimated of the grammatical categories.”

Carey (2008: 117): ”In languages like English, every sentence we speak requires us to make quantificational commitments. **Are we speaking about one or more than one**?”

Feature 34A: Occurrence of Nominal Plurality



Values		
	No nominal plural	28
	Only human nouns, optional	20
	Only human nouns, obligatory	40
	All nouns, always optional	55
	All nouns, optional in inanimates	15
	All nouns, always obligatory	133

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The debate

In languages that have plural number, this is always morphologically marked.

(1) a boy vs. boy**s**
a car vs. car**s**
an elephant vs. elephant**s**

There is a vivid debate as to whether or not morphological markedness correlates with additional semantic interpretation.

- Is the plural more specific than the singular?

Morpho-syntactic parametri-zation

Languages differ as to whether or not plural marking is required in the presence of numerals.

(2) two elephants

(3) a. iki fil *Turkish*
two elephant

b. *iki fil-ler
two elephant-pl

Corbett (2000: 211): ”the numeral phrase is the most likely place for plural not to be required.”

- Why is that the case? What other properties does it correlate with?

This talk

- Re-visit these two questions.
- Based on joint work with Kazuko Yatsushiro and Uli Sauerland, I present evidence for the unspecified nature of plural across languages.
- If plurals are alike across languages, then why do we find differences in morpho-syntactic behavior?
- Argue that this can be dealt with as an agreement-related phenomenon, as in Ionin & Matushansky (forthcoming), see also Bayirli (2017) and others.

Roadmap

- Present different views on the relationship between morphological and semantic markedness as well as the morpho-syntactic distribution of plurality.
- Experimental as well as cross-linguistic evidence in favor of uniform semantics for plurality.
- Re-evaluate the distribution of plural marking in the context of numerals.

Plural and morphological markedness

Universal 35 (Greenberg 1963):

There is no language in which the plural does not have some non zero-allomorph, whereas there are languages in which the singular is expressed only by zero.

Plural and morphological markedness

Non-singular categories are **marked** categories.

Jakobson (1968): zero expression belongs to the unmarked member of a category.

Correlation with frequency, see Haspelmath & Karjus (2017), Kurumada & Grimm (2017) for recent discussion.

Plural and semantic markedness

Bale & al. (2011):

"A noun with an unmarked feature can often be used to quantify over more types of entities than a noun with a marked feature.

The great hope is that if the semantic diagnostics tell us a particular category in unmarked, the morphological ones should as well."

- Plural should be semantically marked.

Two interpretations for the plural

Farkas & Swart (2010):

(4) a. Mary saw *a horse*.
b. Mary saw *horses*.

- The singular refers to one entity, while the plural refers to **more than one** entity.

- **Exclusive plural (= marked)**

Two interpretations for the plural

In certain contexts, downward entailing, however, the plural does not refer to *more than one*.

This is a semantically under-specified interpretation, in which case the singular is included in the plural (van Eijck 1983, Hoeksema 1983, Krifka 1989, Sauerland 2003, Spector 2007, and others):

(5) Every guest who brought presents left early.

true if a guest only brought one present

false if a guest who brought only one present stayed until late

- **Inclusive plural (= unmarked)**

A pragmatic account

- Why is the inclusive interpretation not always available?

(6) #My noses itch.

#I have noses.

- Pragmatic blocking effect (Krifka 1989, Sauerland 2003 and subsequent work):

Maximize Presupposition (Heim 1991)

When there are two alternative expressions, use the one with a stronger presupposition whenever its presupposition is satisfied.

but cf. Farkas & de Swart (2010), Kiparsky & Tonhauser (2013), Marti (2017) among others for alternatives.

Parametrization of plurality

Bale & Khanjian (2014), Mathieu (2014):

- Type I: **English**, the plural is inclusive.
- Type II: **Turkish**, the plural is exclusive.
- There is always **one** form that is unspecified:
  - in type I languages = **plural**
  - in type II languages = **singular** (bare form, *general number*, Corbett 2000).
- Type II languages: Turkish, Hungarian, Persian, Creoles, Balinese, etc.
- In type II languages, plural is incompatible with numerals.

cf. Bouchard (2002), Déprez (2005), Wiltschko (2008) for other parametrization approaches.

Turkish

In Turkish the bare form is unspecified:

(7) Kitap al-d-m
book buy-past-1sg
I bought a book/books.

- **Morpho-syntactic trait**: plural is incompatible with numerals:

(8) iki çocuk
two boy

(9) *iki çocuk-LAR
two boy-pl

Hungarian

Pseudo-incorporation contexts: general number interpretation, Farkas & de Swart (2010):

(10) Mari verset olvas.
Mari poem-acc read
Mari is reading a poem/poems.

- Numerals occur without plural marking:

(11) hét alma
seven apple
seven apples (Dékany 2011)

Creoles: Haitian Creole

(12) Jan te achte (de) chwal
John bought (two) horse*(s)

(13) Jan achte liv/kay pou Pòl.
John bought books/a house for Paul

Déprez (2005)

- Support for the correlation between unspecified bare/singular form and incompatibility with numerals.

Parametrization of plurality

If Bale & colleagues are right with respect to how the morphological and semantic diagnostics should align,

- we expect Turkish (and all languages that have a similar morpho-syntax) to show exclusive only readings in contexts where English allows for inclusive interpretations (cf. Marti 2017).

- This is an interesting test-case not only from a theoretical point of view but also a developmental perspective.

Parametrization of plurality

Moreover, if Bale & colleagues are right with respect to how the morpho-syntactic trait should correlate with the diagnostics,

we would have support for the view that there are **many a plural**, i.e. the plural can be in different positions along the spine of noun phrase, as the plural would not mean the same thing across languages. Different heads in the spine would be responsible for the different readings.

(cf. Acquaviva 2008, Wiltschko 2008, Harbour 2008, 2012, Alexiadou 2011, Mathieu 2014, and others)

Experimental evidence

Earlier work:

1. Children's acquisition in English, Sauerland et al. (2005), Tieu et al. (2014, *SALT*)
2. Adult comprehension: Sauerland et al. (2005), Pearson et al. (2010, *SALT*)
3. Childrens' acquistion of plural in 18 languages, Yatsushiro, Sauerland & Alexiadou (2017, BUCLD), none of the Hungarian/Turkish type.

Current work:

- Children's acquisition of plural in Hungarian and Turkish (Yatsushiro, Alexiadou, Geckin, Harmati-Pap, Sauerland 2018)
- independent work by Renans et al. (2017) on Turkish

Predictions

1. If Plural is inclusive, it contains the singular context.
2. If Plural is exclusive, it is incompatible with the singular context,

- Because of *Maximize Presupposition*, adults should reject the use of plural in a singleton situation.
- Children may accept the use of plural in a singleton situation more readily.
- If Turkish and similar plurals are marked, we expect differences between English and Turkish.

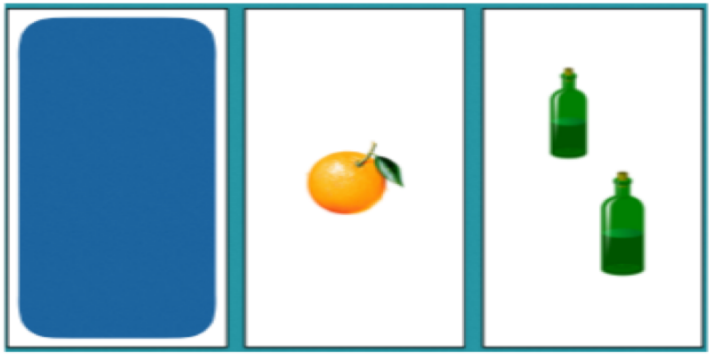
The task

- **Adapted covered box task**:
  Three options, two open, one covered

  Types of items:
  Target card: covered, number-mismachted refererent visible.
  Control 1: Target card: open; number-matched referent visible.
  Control 2: Target card: covered; no other card with matching referent.

The task

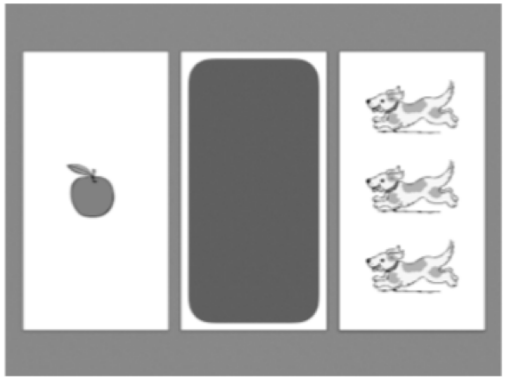
- Zeig mir die Karte mit Orangen
  Show me the card with oranges



- 2 Open cards: an orange, two bottles
- 1 Covered card
- Target card: Covered

Control Items

- Zeig mir die Karte mit Hunden
  Show me the card with dogs



- 2 Open cards: three dogs, an apple
- 1 covered card
- Target card: open

- Zeig mir die Karte mit Löwen
  Show me the card with lions

- 2 Open cards, neither of them lions
- 1 covered card
- Target card: covered

The participants

- **Hungarian:**

25 monolingual children (3,5 to 6, 8; M: 5,5)

10 monolingual adults

- **Turkish:**

32 monolingual children (4,3 to 6,3; M: 5,0)

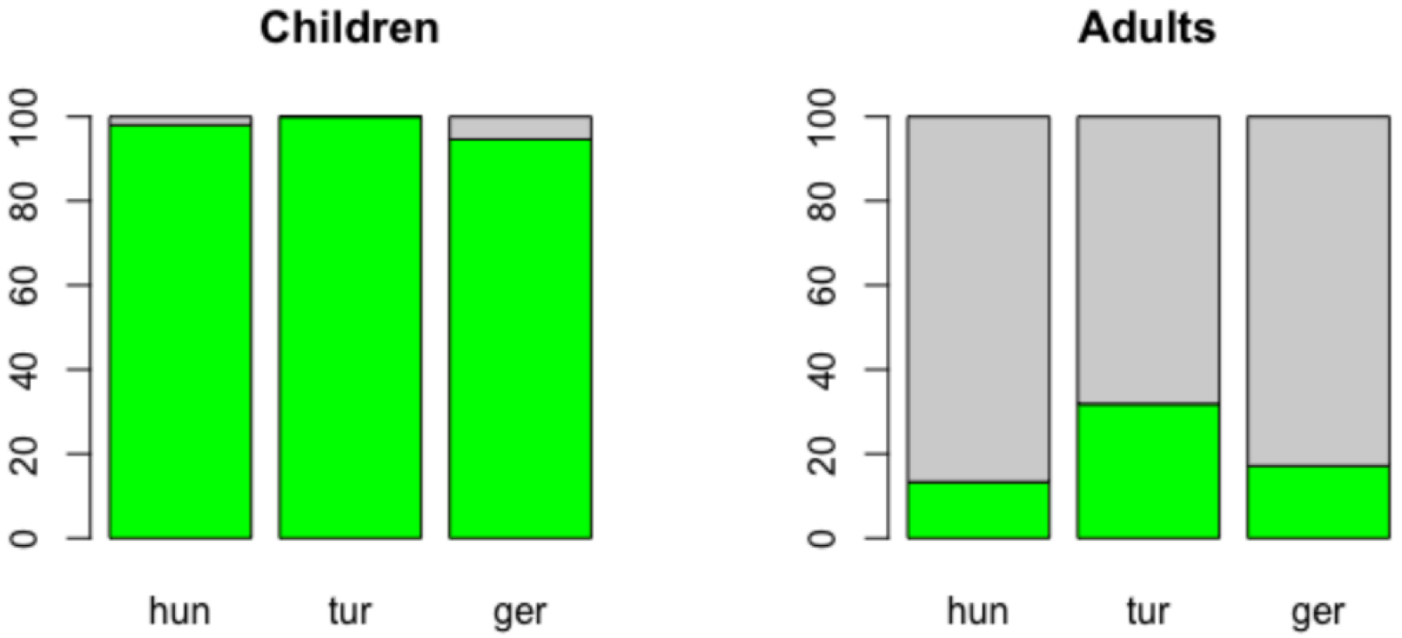
11 monolingual adults

- **German:**

24 monolingual children (3,6 to 5,11; M: 4,8)

10 monolingual adults

Yatsushiro & al. 2018



Experimental Conclusion

- Children in all languages accept the use of the plural in a singular context while adults never do so.

Discussion

- The prediction made by Bale & colleagues was not confirmed.
- Surprising at first sight, but these experimental results are in line with theoretical investigations on these two languages.
- Contexts which induce inclusive plurality in English do so both in Hungarian and Turkish.

Hungarian plural = inclusive

- Farkas & de Swart (2010), Eva Dékany (pc):

(14) a. If you have children, please raise your hand

b. Ha van-nak gyerek-e-i, emel-j-e fel
if be.3pl child-poss-pl raise-sbj-3sg up
a kez-é-t
the hand-poss-acc

- In both languages, you can raise your hand if you have only one child.

Turkish plural= inclusive

- Sag (2017):

(15) Eg ̆er erkek-ler tarafından aldat-ıl-dı-y-sa-n,
if man-pl by cheat-pass-past-cop-cond-2sg
sen de biz-eif katıl-abil-ir-sin.
you also we-dat join-abil-aor-2sg
'If you have been cheated by men, you can join us.'

(one or more man)

Across type II languages?

Balinese (Austronesian):

(16) Nyoman ningalin njek~njekan buron.
Nyoman AV.see footprint-REDUP animal
'Nyoman saw animal footprints (more than one).'

(17) Nyoman sing ningalin njek~njekan buron.
Nyoman NEG AV.see footprint-REDUP animal
'Nyoman didn’t see even a single animal footprint.'

(Arka & Darlymple 2017: 313)

Interim summary

- Plural is perhaps universally semantically unspecified.
- Morphological markedness does not correlate with semantic markedness (Sauerland 2008).
- There is only one plural in morpho-syntactic structure.

- **Two (new) questions**:

i) why should plural enter competition with another unspecified form? In other words, why would a language like Turkish have two un-specified forms (cf. Arka & Dalrymple 2017)?

ii) What explains the morpho-syntactic trait of type II languages, i.e. *plural with numerals?

Some options

A. **Numerals differ**: in Hungarian/Turkish they function like plural markers, see e.g. Borer (2005).

- Predicts strict complementarity between numerals and plurals/**classifiers**, not attested in Turkish and Hungarian:

(18) h´et sz´al vir´ag *Hungarian*
seven clthread flower
seven flowers

- No explanation why plural is not allowed with other quantifiers.

(19) mindenféle gyerek / *mindenféle gyerek**ek***
all.kind child / all.kind child.PL
all kinds of children Farkas & de Swart (2010)

Some options

B. In type II languages the bare noun is actually **strictly singular**.

- Sag (2017): In episodic contexts, bare nouns are strict singular and definite as opposed to plurals which can receive an existential reading.

(20) Cocuk sokak-ta top oynu-yor.
child street-loc ball play-prog-3pl
'The child is playing ball on the street.'

Not: 'Children are playing ball on the street.

Not: 'The children are playing ball on the street.'

- Not expected if the bare form were an inclusive set (atoms and pluralities).

Some options

C. The presence of plurality with numerals is simply **agreement**, see Krifka (1989), Ortmann (2000), Ionin & Matushanksy (forthcoming), Farkas & de Swart (2010), Bayirli (2017), Matushansky & Ruys (2014), Sag (2017), and many others, though details of implementation differ.

- Type I languages are **plural agreement** languages (English, German, etc.).
- Type II languages are **not plural agreement** languages (Hungarian, Turkish, Balinese, etc.).
- This is similar to e.g. subject-predicate agreement.

Zooming in on Option C

- Presence/absence of agreement does **not** correlate with the semantics of plurality, see also Ortmann (2000).
- Presence/absence of agreement does **not** correlate with the availability of another unspecified form, contra Bayirli (2017), see also Ortmann (2000), Ionin & Matushansky (forthcoming).
  - Absence of agreement in languages such as Finnish and Archi, which do not have general number.
  - Absence of agreement in child English and English varieties.
- Does it correlate with anything?

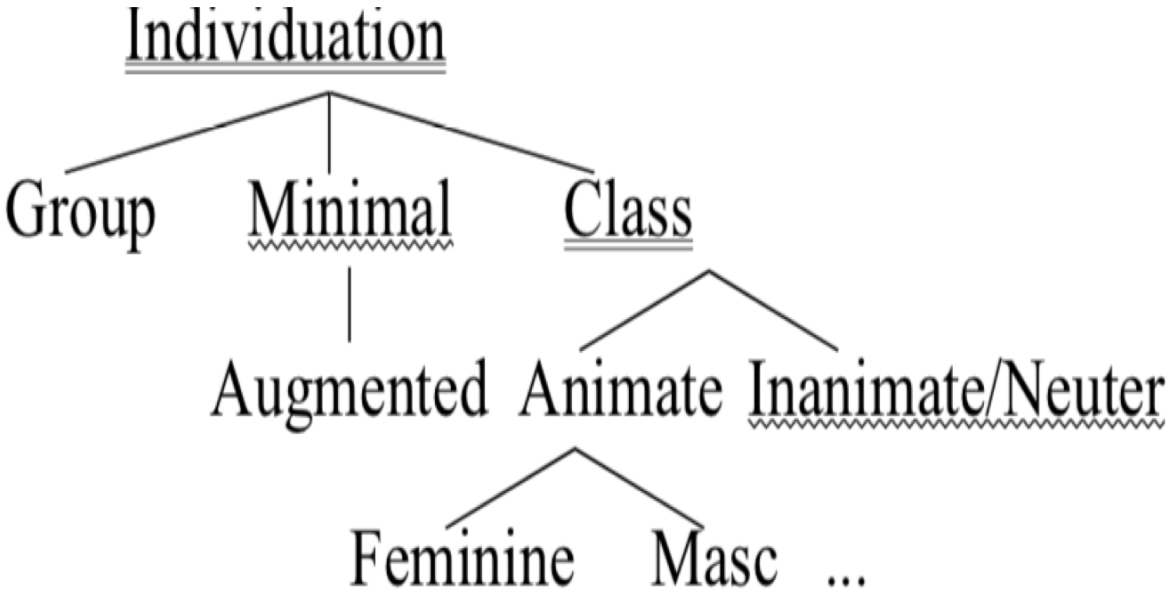
A possible correlation?

- **Greenberg (1963:95) Universal 36**:
- '[i]f a language has the category of gender, it always has the category of number.

- Di Garbo (2014), citing Creisels & al. (2008) for African languages:
- When gender marking is absent, number marking tends to remain optional.
- **Languages that lack plural agreement tend to lack gender** distinctions (close to perfect).
- As a result, when plurality is present it tends to have an effect of individuation (animacy, etc.)

Feature geometry and plurality

Harley & Ritter (2002):



In the absence of class, number takes over and individuates, cf. Anagnostopoulou (2017)

Agreement

Following Pollard and Sag (1994), Wechsler and Zlatić (2003), Wechsler (2011), Landau (2016), Wurmbrand (2017), Smith (2015), Ionin & Matushansky (forthcoming) and others,

two types of agreement:

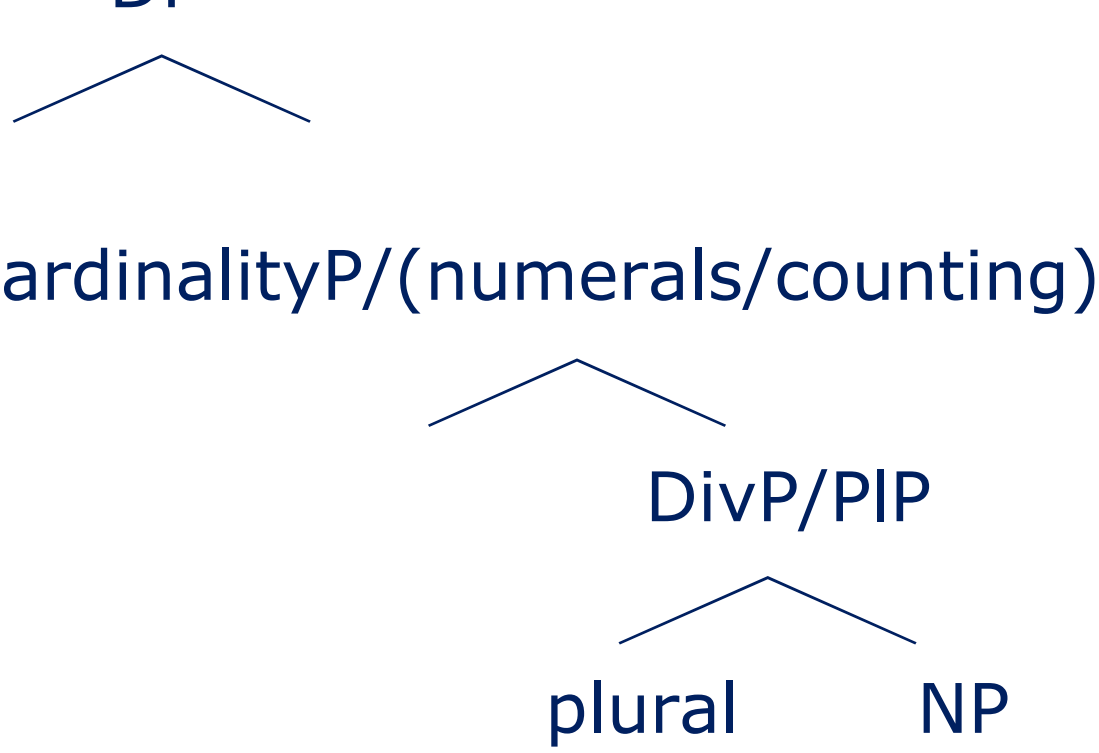
- **grammatical/formal agreement (concord)**: target form depends on controller's formal phi features
- **semantic agreement (index)**: target form depends on controller's meaning

- Both take place in the syntax and control morphological marking.

DP structure

- DP structure: Heycock & Zamparelli (2005), Borer (2005), Klockmann (2017), and others:

(21)



Deriving the patterns

- Numerals are in CardinalityP/QuantityP.

- Following Ionin & Matushansky (forthcoming): plural marking with numerals is agreement throughout.

- Plural is located in Div, but realized on the lexical noun. Nouns are not lexically specified as individuated. This happens in DivP, Borer (2005).
- Plurals across languages are generated in DivP and this yields the inclusive interpretation (one or more), partly agreeing with Mathieu (2014).

Plurality splits

Plurality splits along two hierarchies:

Animacy hierarchy:

(22) 1 >2 > 3 > human > animate > inanimate

Definiteness hierarchy:

(23) Pronoun > proper name > definite > specific >

Corbett (2000), Ionin & Matushanksy (forthcoming)

Differential Marking (DM) effects

- Stolz (2007: 22)

Table 3: Restrictions on pluralization

language	number distinctions	restrictions related to
Japanese	absent	-
Chamorro	singular ≠ plural ≠ dual	**animacy/definiteness**: Only animate nouns have bound plural markers, inanimate nouns optionally take free plural markers when definite or when used as nominal predicates
Georgian	singular ≠ plural	**animacy**: Nouns have bound plural markers, only animate nouns trigger agreement on verbs
Basque	singular ≠ plural	**definiteness**: Nouns have bound plural markers which always co-occur with definiteness markers
Hungarian	singular ≠ plural	**numerals**: Nouns have bound plural markers which are excluded from combinations with numerals

DM effects

- Stolz (2007: 31):

Table 10: Creoles

language	classes		comment
Annobonese	human	other	**animacy/definiteness**: Only definite human nouns are overtly marked for plural
Berbice Dutch	animate	inanimate	**animacy/definiteness**: Only definite animate nouns are overtly marked for plural
Kriôl (Bissau)	animate	inanimate	**animacy/definiteness**: Only definite animate nouns are optionally marked for plural
Angolar	animate	inanimate	**definiteness**: Pluralization correlates with definiteness
Saramaccan	no lexical classes		**definiteness**: Pluralization correlates with definiteness
Palenquero	no lexical classes		**definiteness**: Pluralization correlates with definiteness
Haitian	no lexical classes		**definiteness**: Pluralization correlates with definiteness

Not areal-ly restricted

Creoles show similar effects to Persian (and Western Armenian), see Doetjes & al. (2017):

(24) ketab-ha*(-ro) xund-ñm. *Persian*
book-pl*(-om) read.past-1sg
`I read the books.'

Ghomeshi (2003: 57)

- How do DM effects emerge?

DM effects

- Building on Ionin & Matushansky (forthcoming), Anagnostopoulou (2017),

- DM effects track individuation features.
- These may which differ across languages along the lines of DM effects in other domains (animacy, definiteness, specificity, etc.).

Conclusion

- Plural is universally semantically unmarked.
- There is only one head hosting plurality in the syntax.

- Mismatch between formal marking and semantic interpretation:
  - not areal-ly restricted
  - independent of form of plurality

Conclusion

- Co-occurrence of plurals with numerals is an agreement phenomenon, subject to DM effects.

- Experimental and theoretical cross-linguistic investigation raises the question as to what exactly general number is.

References

Acquaviva, P. 2008. *Lexical plurals*. Oxford: Oxford University Press.

Alexiadou, A. 2011. Plural mass nouns and the morpho-syntax of number. In *Proceedings of WCCFL* 28, ed. M. B. Washburn, K. McKinney-Bock, E. Varis, A. Sawyer & B. Tomaszewicz, 33-41. Somervill, MA: Cascadilla Press.

Anagnostopoulou, E. 2017. Accusative case morphology conditioned by gender. Panel on Case, MIT, February 2017.

Arka, W. & M. Darlymple. 2017. Nominal, pronominal, and verbal number in Balinese. Linguistic typology 21: 261-331.

Bale, A, M. Gägnon & H. Khanjian. 2011. Crosslinguistic representations of numerals and number marking. Proceedings of SALT 20.

Bale, A. & H. Khanjian. 2014. Syntactic complexity and competition: The singular-plural distinction in Western Armenian. *Linguistic Inquiry* 45: 1-26.

Bayirli, I.K. 2017. The universality of concord. PhD dissertation MIT.

Borer, H. 2005. *In name only*. Oxford: Oxford University Press.

Carey, S. 2009. The origin of concepts. Oxford University Press.

Bouchard, D. 2002. *Adjectives, number and interfaces: why languages vary*. Amsterdam: Elsevier.

Corbett, G. G. 2000. Number. Cambridge: Cambridge University Press.

Dekany, E. 2011. A profile of the Hungarian DP. PhD dissertation, University of Tromso.

Déprez, V. 2005. Morphological Number, Semantic Number and bare Nouns' *Lingua* 115: 857-883.

Doetjes, J. V. Nyst & A. Jean-Jacques Tano. 2017. Number marking in FRANÇAIS POPULAIRE IVOIRIEN: evidence for structure based competition. Paper presented at the Workshop Microvariation in Semantics, Potsdam Satellite workshop, SuB 22.

van Eijck, J. 1983. Discourse representation theory and plurality.> In Alice ter Meulen (ed.), Studies in modeltheoretic semantics,> 85–106. Dordrecht: Foris.

Di Garbo, F. 2014. Gender and its interaction with number and evaluative morphology. PhD dissertation, Stochholm University.

Farkas, D. & H. de Swart. 2010. The Semantics and Pragmatics of Plurals. Semantics and Pragmatics 3: 1–54.

Ghomeshi, J. 2003. Plural marking, indefiniteness, and the noun phrase. Studia Linguistica 57: 47–74.

References

Greenberg, J. H. 1963. Some Universals of Grammar with Particular Reference to the Order of Meaningful Elements. In Greenberg, Joseph H. (ed.), Universals of Human Language, 73-113. Cambridge, Mass: MIT Press.

Harley, H. & E. Ritter. 2002. Person and numbers in pronouns: a feature-geometric analysis. Language 78: 482-526.

Haspelmath, M., & Karjus, A. 2017. Explaining asymme- tries in number marking: Singulatives, pluratives and usage frequency. *Linguistics*.

Heycock, C. & R. Zamparelli. 2005. Friends and Colleagues: Plurality, Coordination, and the Structure of DP. *Natural Language Semantics* 13: 201-270.

oeksema, Ja. 1983. Plurality and conjunction. In Alice ter Meulen> (ed.), Studies in modeltheoretic semantics, 63–83. Dordrecht: Foris.

Ionin, T. & O. Matushansky. Fortcoming. The syntax and semantics of numerals. Ms.

Jakobson, R. 1968. Child language, aphasia and phonological universals. Mouton de Gruyter.

Jespersen, O 1924. The philosophy of grammar. London: Allen & Unwin.

Kiparsky, P. & J. Tonhauser. 2013. Semantics of inflection. In *Semantics: An International Handbook of Natural Language Meaning*, Berlin: Mouton de Gruyter; Maienborn, Claudia, Klaus von Heusinger and Paul Portner (eds.), pp.2070-2097.

Klockmann, H. 2017. The design of semi-lexicality. PhD dissertation, Utrecht.

Krifka, M.1989. Nominal reference, temporal constitution and quantifi- cation in event semantics. In Renate Bartsch, Johan van Benthem & Peter van Emde Boas (eds.), *Semantics and contextual expression*, Dordrecht: Foris publication.

Kurumada, C & S. Grimm 2017. Communicative efficiency in language production and learning: Optional plural marking. Proceedings of the 39th Annual Meeting of the Cognitive. Science Society.

Landau, I. 2016. DP internal agreement: a configurational analysis. Natural Language and Linguistic Theory 34: 975-1020.

Marti, L. 2017 Inclusive plural and the theory of number. Ms.

Mathieu, E. 2014. Many a plural. *In* Weak Referentiality Ana Aguilar-Guevara, Bert Le Bruyn and Joost Zwarts (eds.) John Benjamins pp. 157–182.

References

Matushansky, Ora, & E.G. Ruys. 2014. On the syntax of measure. Paper presented at TIN- dag 2014, Utrecht, February 1, 2014.

Ortmann, A. 2000. Where plural refuses to agree: feature unification and morphological economy. *Acta Linguistica Hungarica* 47: 249-288.Pollard, C. & I. Sag. 1994. Head-driven phrase structure grammar. Chicago: University of Chicago Press

Renans, A., Tsoulas, G., Folli , Ketrez, N., de Vries, H. & Romoli, J. 2017 Turkish plural nouns are number-neutral: experimental data. Pre-proceedings of the Amsterdam Colloquium 2017

Sag, Y. 2017. The semantics of numeral constructions in Turkish. Paper presented at SuB 22, Potsdam.

Sauerland, U.. 2003. A New Semantics for Number. In Rob Young & Yuping Zhou (eds.), Proceedings of the 13th Semantics and Linguistic Theory Conference, 258–275. Ithaca, N.Y: Cornell University CLC Publications.

Sauerland, U. 2008. On the semantic markedness of Φ-features. In Daniel Harbour, David Adger & Susana Bejar (eds.), *Φ-Features*, 57–82. Oxford: Oxford University Press.

Sauerland, U., J. Anderssen & K. Yatsushiro. 2005. The Plural is Semantically Unmarked. In Stefan Kepser and Marga Reis (eds.), Linguistic Evidence, 409–30. de Gruyter.

Smith, P. 2015. Feature Mismatches: Consequences for Syntax, Morphology, and Semantics. PhD diss., University of Connecticut, Storrs, CT.

Spector, B. 2007. Aspects of the Pragmatics of Plural Morphology: on Higher-Order Implicatures. In Uli Sauerland & Penka Stateva (eds.), Presuppositions and Implicatures in Compositional Semantics, 243–281.

Stolz, T. 2007 .Lexical typology, language contact and creolization. In: *Language Contact and Language Change in the Caribbean and beyond/Lenguas en contacto y cambio lingüístico en el Caribe y más allá*, hg von. Wiltrud Mihatsch und Monika Sokol, 19–36. Frankfurt am Main: Peter Lang.

Wechsler, S. & L. Zlatić. 2003. *The Many Faces of Agreement* . Stanford, CA: CSLI Publications.

Wiltschko, M. 2008. The syntax of non-inflectional plural marking. *Natural Language and Linguistic Theory*. 26: 639-694.

Wurmbrand, S. 2017. Formal and semantic agreement in syntax: a dual feature approach. Olinco Proceedings, 19-36.

Yatsushiro, K., U. Sauerland & A. Alexiadou. 2017. The Unmarkedness of Plural: Crosslinguistic Data. In Maria LaMendola & Jennifer Scott, BUCLD 41: Proceedings of the 41st annual Boston University Conference on Language Development, 753-765. Somerville, USA: Cascadilla.