# PAUCITY: WHERE IS THE UPPER BOUND?

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# OUTLINE OF THE TALK

- The dual and the paucal: Parcelling out semantics vs pragmatics
- A study of English *couple*: at least two
- A new semantics and pragmatics for dual
- A study of Slovenian dual entailments
- Looking towards the paucal

# PAUCALS IN TYPOLOGY

- Singular, dual, and plural are well-known and currently handled within features such as [±singular] and [±augmented]

$$[+\text{augmented}] = \lambda P \lambda x \exists y [y \subset x \wedge P(x) \wedge P(y)]$$

+singular, -augmented = *singular*

-singular, -augmented = *dual*

-singular, +augmented = *plural*

-augmented(-singular, +augmented) = *trial*

# DUALS AS INFLECTIONAL CATEGORIES

- When we say a language 'has a dual', we mean as a productive *inflectional category*, showing agreement on verbs and adjectives as well, as found, e.g., in Sámi:

Dat guokte mánat *boahti-* *ba* deike.
those two children.NOM come.PRES- DL here
'Those two children come here.'

# PAUCALS IN TYPOLOGY

- Singular, dual, and plural are well-known and currently handled within features such as [±singular] and [±augmented]
- Can be recursively used for trials, quartals as well: [-aug]([+aug]([-sg]))
- Corbett (2001:22) languages such as Bayso have a category of paucal that is used for quantities of 'between 2 and 6', i.e. with an *upper bound*
- For Harbour 2014, modelling this involves 'just' one more feature, but before going there, I wanted to think about whether it's needed (indeed given the fact that it is virtually never reflected in agreement, unlike dual)

# A STUDY OF *COUPLE*

# BACKGROUND: SEMANTICS OF NUMERALS

- Claim: numerals are semantically ambiguous
- Lower-bounded reading:

Existential closure: ∃ group G, three-students(G) ∧ came-to-party(G)

- Exact-reading:

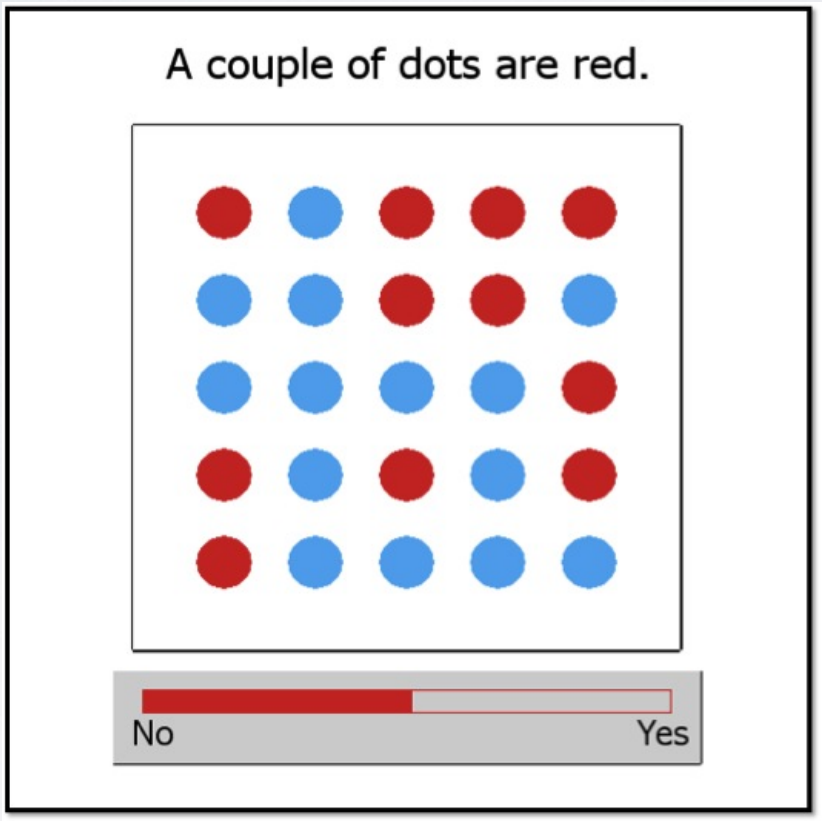
Maximization: [ three N ] VP is interpreted as: the *maximal* group G, students(G) ∧ came-to-party(G) has cardinality 3

- Result (Marty, Chemla & Spector 2015): *between three and five* has a 'phantom' reading delivered by existential closure of 'at least three', but the pragmatics usually blocks this (because, why not just use 'three')?

# RESULTS AND PREDICTIONS

- Given that Marty et al found phantom readings for *between*-expressions, what about English *couple*? Does it have a semantics of exactly two, or is it more like two (or two plus epsilon)
- The pragmatic calculation that disfavors *between three and five* due to its complexity (why mention *five*) is less likely to arise with *couple*

# TRUTH-JUDGEMENT ON A SLIDER



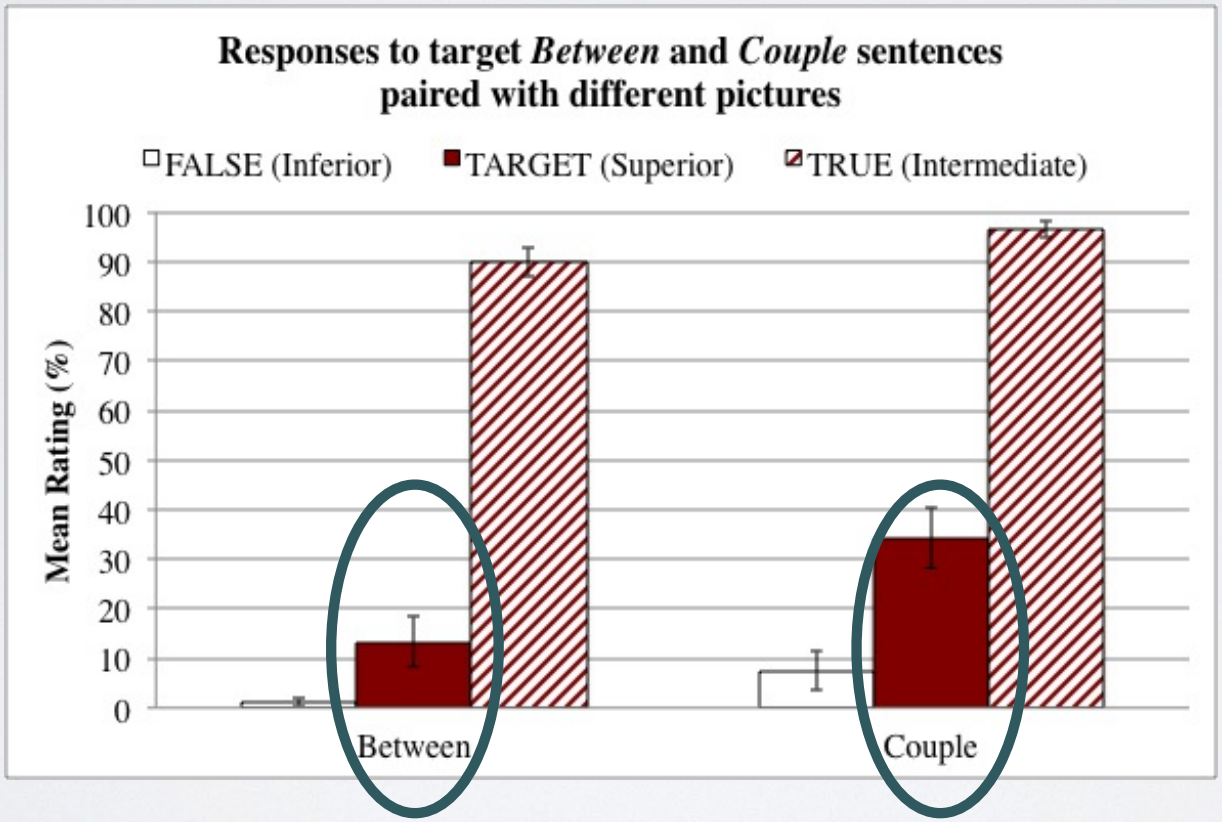

Idea: in cases of ambiguity, the more readings that are true (e.g. one-sided and two-sided) the higher the truthiness rating

# CONDITIONS COMPARED

| Sentence type | Label | Description of the pictures |
|---|---|---|
| *Couple* | *Inferior* | ⟨color⟩ dots = 1 |
| | *Intermediate* | ⟨color⟩ dots = 2 |
| | *Superior* | 3 ≤ ⟨color⟩ dots ≤ 11 |
| *Between* | *Inferior* | ⟨color⟩ dots = 1 |
| | *Intermediate* | 2 ≤ ⟨color⟩ dots ≤ 6 |
| | *Superior* | 7 ≤ ⟨color⟩ dots ≤ 11 |
| *Low Numeral & At Least* | *Inferior* | ⟨color⟩ dots = 1 |
| | *Intermediate* | ⟨color⟩ dots = 2 |
| | *Superior* | 3 ≤ ⟨color⟩ dots ≤ 7 |
| *High Numeral & At Most* | *Inferior* | 1 ≤ ⟨color⟩ dots < 6 |
| | *Intermediate* | ⟨color⟩ dots = 6 |
| | *Superior* | 7 ≤ ⟨color⟩ dots ≤ 11 |
| *Some & All* | *Null* | ⟨color⟩ dots = 0 |
| | *Partial* | 0 < ⟨color⟩ dots < dots |
| | *Total* | ⟨color⟩ dots = dots |

both readings false
both readings true
one reading true

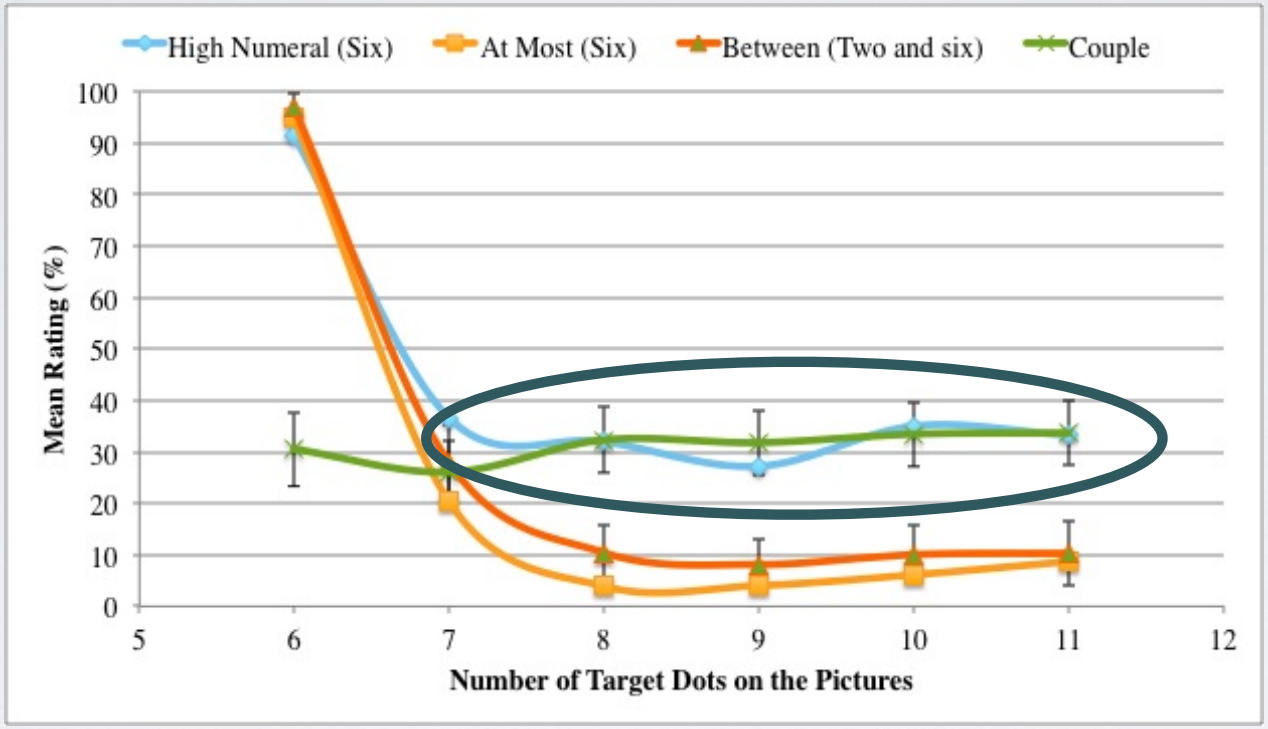
# RESULT: COUPLE WITH {4-11} IS OF INTERMEDIATE TRUTH




n=22, British English

*Intermediate truthiness for superior readings*

# RESULT: *COUPLE* PATTERNS MORE LIKE '6' THAN 'AT MOST 6'



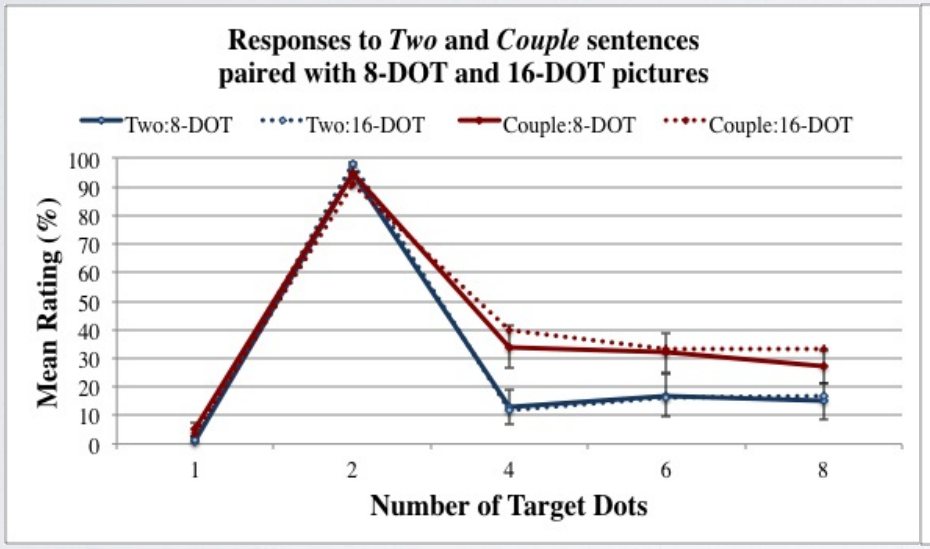

n=22, British English

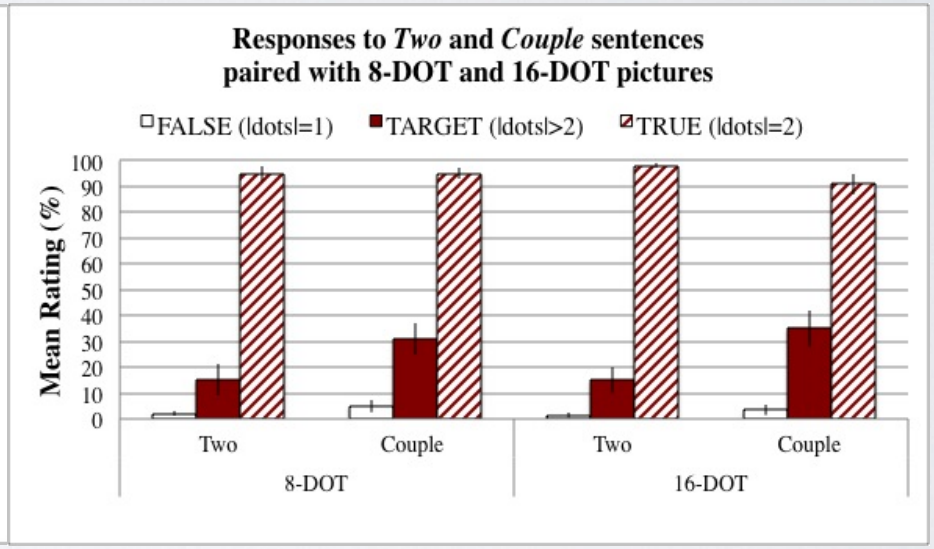
# CALCULATING ALTERNATIVES

- Suppose that *two, couple, some* have their usually optional 'exact' reading forced in the presence of *only*, as this cancels other alternatives on the scale
- For *two,* the alternatives are *three, four,* etc., and for *some*, the alternatives are *many, all,* etc. But what about *couple*? Arguably these are less well-defined, and may include *a lot, several*, without clear boundaries
- We decided to compare the acceptability of *only two* vs *only a couple* to describe four, six, eight dots.

# *ONLY A COUPLE* IS LESS STRICT THAN *ONLY TWO*

Use of *only two* degrades sharply with four dots, as clear alternatives (e.g. *four dots*) have been openly negated




Use of *only a couple* remains okay with four dots, depending on which alternatives (e.g. *several dots, half of the dots*) have been negated

# SUMMARY OF RESULTS

- English *couple*, thought to mean 'exactly two' (with an etymological basis for this) has a paucal meaning.
- Paucals in less well-understood languages may be more like English *couple* than a dedicated number category
- Paucals may have the semantics of 'at least two', and a pragmatics that competes with a range of alternatives

# PREDICTIONS FOR DUAL

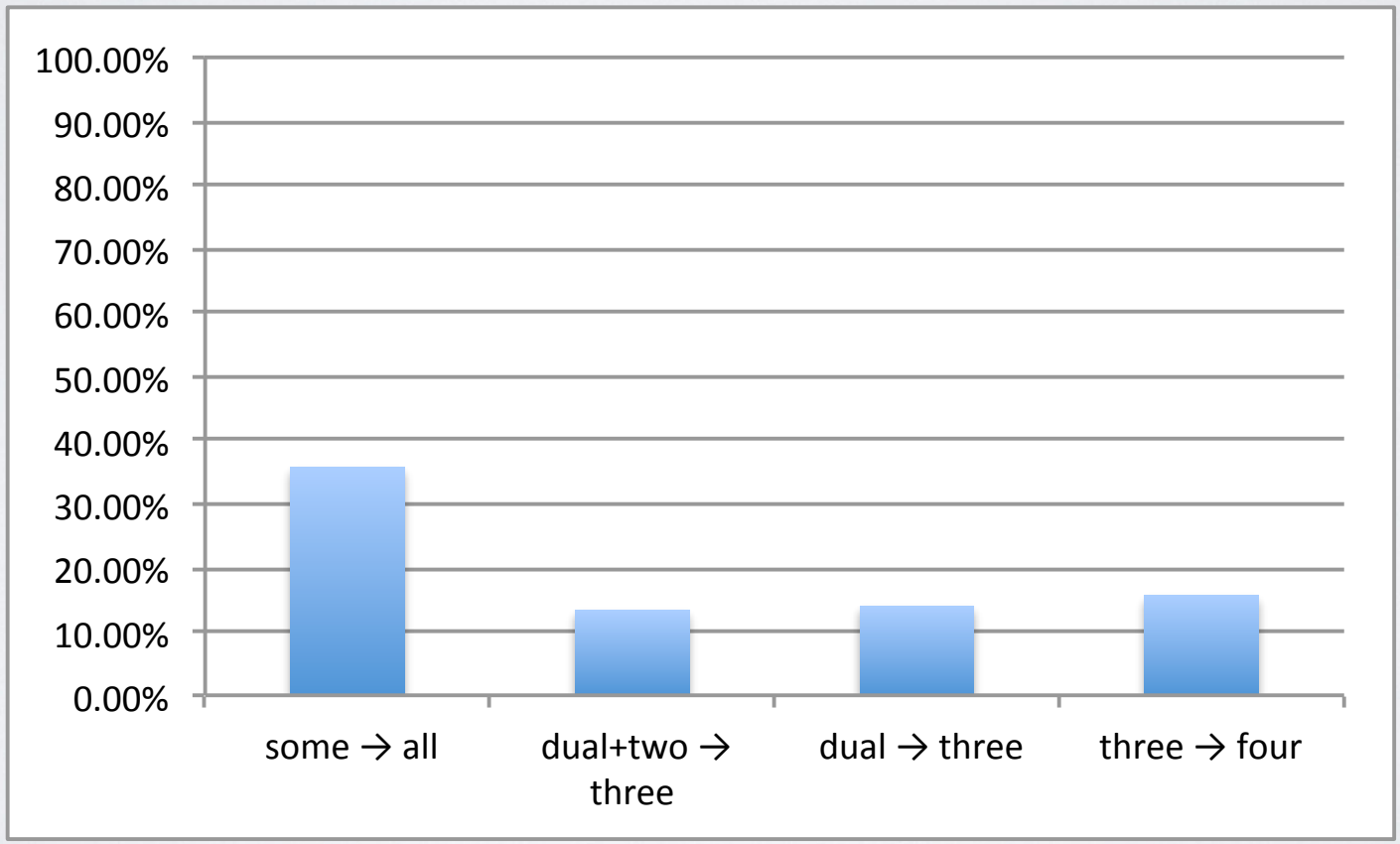
- Dual doesn't semantically mean "exactly two"
- It means "at least two", and in downward entailing contexts this meaning shines though, the same way that "some" doesn't mean "not all", as diagnosed in DE contexts

# SLOVENIAN DUALS

# UPWARD ENTAILING ENVIRONMENT

Janezov prijatelj je prodal bicikla.
Janez's friend aux sold bikes.dual

Ali je ta stavek dober opis situacije tudi, e je
Is this sentence a good description ot the situation if
Janezov prijatelj prodal tri bicikle?
Janez's friend sold three bikes?

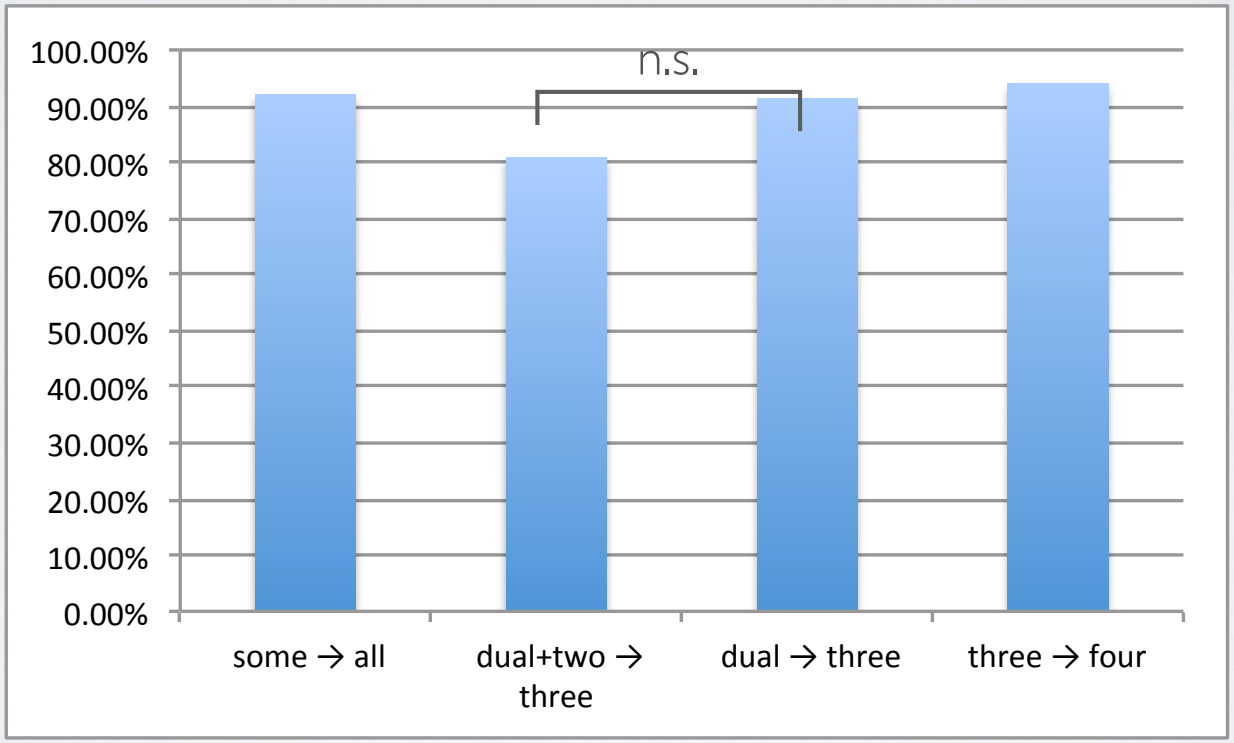



Slovenian, n = 30 (three items per condition, plus fillers)

# DE ENVIRONMENT: ANTECEDENT OF CONDITIONAL

Če Eva na tomboli zadane tortici, bo gotovo vesela.
if Eva on tombola wins cakes.du will surely happy
"If Eva wins two cakes in tombola, she will be very happy."

Ali bo Eva vesela, e na tomboli zadane tri totice?
Q will Eva happy if on tombola wins three cakes
"Will Eva be happy if she wins three cakes on tombola?"

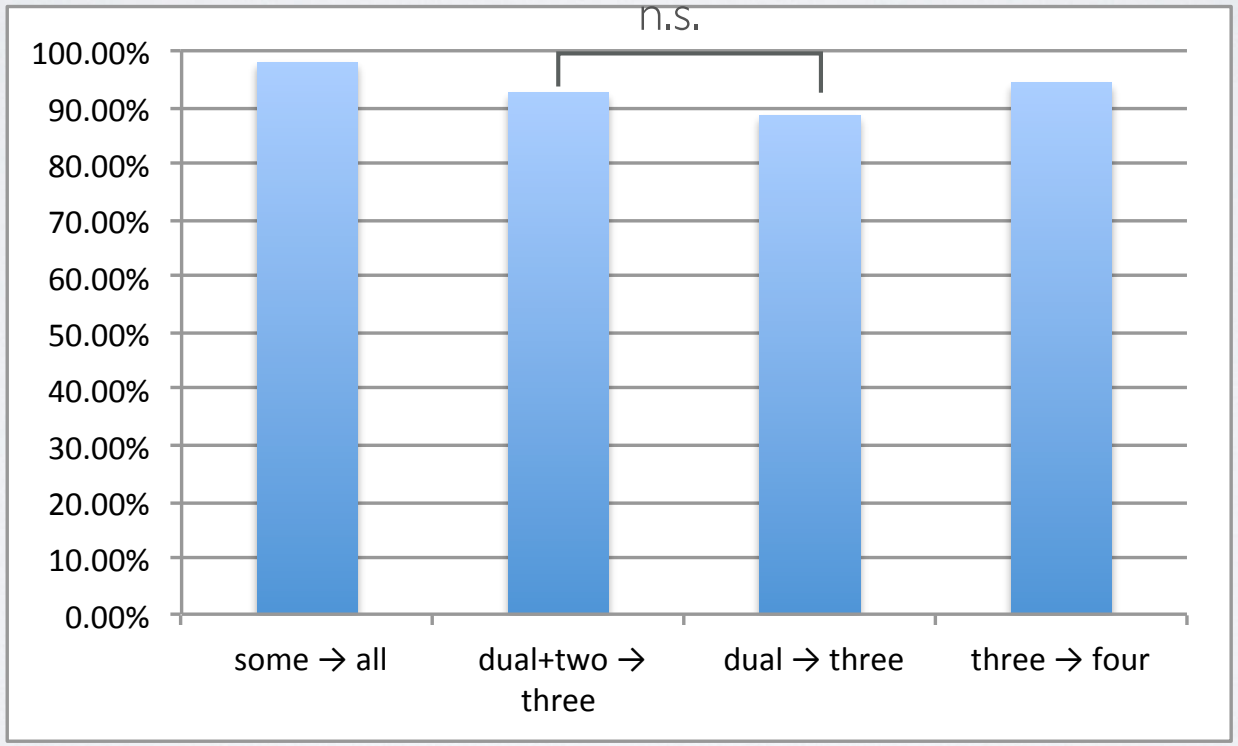



Slovenian, n = 30 (three items per condition, plus fillers)

# DE ENVIRONMENT: RESTRICTOR OF QUANTIFIER

Vsak kratkohlačnik, ki poje banani, dobi za nagrado bonbon.
Each kid which eats bananas.du gets for prize candy
"Each kid who will eat (two) bananas will get a candy as reward."

Ali dobi za nagrado bonbon tudi tisti kratkohlačnik, ki poje tri
Q gets for prize candy also that kid which eats three
banane?
bananas
"Will the one who eats three bananas also get a candy as a reward?"




Slovenian, n = 30 (three items per condition, plus fillers)

# SAUERLAND'S MODEL OF THE DUAL

- Claim: [dual] denotes an entity of at most two singular parts

- Our entailment data provides no support for this model; instead dual denotes *at least* two singular parts

- Sauerland (2008) also reports contexts like "some students brought one book, and others brought two books, but no students brought more than two". We tested n=30, judging the acceptability of each variant

Vsak študent je prinesel s seboj svoj-o knjig-o
every student be.SG brought.MASC with self his.SG book-SG
"Every student brought his book."

48% acceptance

Vsak študent je prinesel s seboj svoj-i knjig-i
every student be.SG brought.MASC with self his.DL book-DL
"Every student brought his books (dual)."

0% acceptance

Vsak študent je prinesel s seboj svoj-e knjig-e
every student be.SG brought.MASC with self his.PL book-PL
"Every student brought his books."

62% acceptance

# LOOKING TOWARDS THE PAUCAL

# FROM DUAL TO PAUCAL

- Slavic languages such as Russian lost the dual and now have a category known as 'paucal' (distinct from that of Corbett's cases) for numerals 2,3,4, though it interacts greatly with gender and case in a way distinct from plural
- If the dual means "at least two" this is perhaps a natural extension once the morphological system of the language has become rearranged without the dual in the same paradigm as plural

# MORPHOPRAGMATIC POSSIBILITIES

- Based on *couple*, languages with a paucal may simply be duals (or trials) and show 'phantom' readings with no upper bound, in the right experiments
- In Mebengokre (Brazil), there is a paucal (Wiesemann 1986), but it really is interpreted as 'some' (Salanova, pers.comm.), and shares morphology with the plural
- Perhaps what is called *the paucal* is really an indefinite plural, e.g. "warriors arrived" while what is called *the plural* is a definite plural, e.g. "the warriors arrived", with maximality imposed by definiteness

# SO WHAT ABOUT THOSE FEATURES AT THE BEGINNING?

- The relation between features like [±singular,±augmented] in the morphology and in the semantics may be like the relationship between phonological features and phonetic reality
- It would be possible to rewrite their definitions, though not in a way that would allow the reuse of [±augmented] elsewhere in morphology
- Instead, I'll contend that such features represent a 'morphologization' of the joint contribution of semantics and pragmatics in canonical upward-entailing environments, but are not, strictly speaking, the last word at LF

# REFERENCES CITED


- Corbett, G. 2001. *Number*. Cambridge Univ. Press.
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- Harbour, D. 2014. *Language* 90.1
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# LACK OF PAUCAL AGREEMENT

- Slovenian: dual auxiliary, dual case endings, dual agreement, all phonologically distinct from one another

- Harbour 2014, fn 9: "One might wish to see agreement for approximative numbers to demonstrate that [±additive] is really in the syntax, rather than packaged away within the lexical semantics of a quantifier"

Sinan kovan-sko-ya sko-ra sk- ún wós anine
ancestor our- 3PC-the 3PC-go 3PC-take word this
'Our ancestors went there and took this word' (van den Heuvel 2006:447)

This single example, to nonspecialist eyes, looks like an incorporated pronoun, rather than agreement

# ANALOGUES OF *COUPLE:* GERMAN

- *ein paar* 'a couple of' (distinct from *ein Paar*, a pair) is often used to refer to up to 10, 20 entities (Casartelli, pers. comm)

(5) Warte noch ein paar Minuten bevor du anrufst.
Wait a couple of minutes before you call.

(6) Es warten ein paar Aufgaben auf Dich.
There are some tasks waiting for you.

- Arguably yet another 'at least two' paucal

# SLAVIC DUAL: SPORADIC EXTENSION, ONLY TO 3?

- Composed numerals:
- dvesta '200' (with dual form on hundred)
- trista '300' (with dual form on hundred)
- cetiristo '400'
- In this (obviously older, intermediate) case, the dual was extended only to 3.