

# An Experimental Investigation into the Morphopragmatics of the Slovenian Dual Inflectional Competition

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# Semantics and Pragmatics of Number

'Plural nouns' in English are so called because they give rise to **plurality inferences**.

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'Plural nouns' in English are so called because they give rise to **plurality inferences**.

(1) Somebody bought *expensive books*.

But they do not simply mean plural in certain grammatical contexts.

- ▶ Bare plurals in Downward Entailing contexts have no plurality inferences (**unmarked plural**).

(2) Nobody bought *expensive books*.

- ▶ Plural definites with bound variables give rise to **partial plurality inferences**.

(3) Every applicant submitted *their journal papers*.

# Overview

↔ PL in English can be semantically number-neutral, and the plurality inference is derived by some other mechanism. (Farkas & De Swart 2010, Grimm 2013, Sauerland 2003, 2008, Spector 2007, a.o.)

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What about other number categories? – **Slovenian dual** (DL)

Is DL similar to the numeral 'two'? Theoretical possibilities:

1. **Bilateral** ('exactly 2')
2. **Lower-bounded** ('at least 2')
3. **Upper-bounded** ('1 or 2') (Dvořák & Sauerland 2006, Sauerland 2008)

We present the results of an acceptability judgment experiment that support the bilateral semantics with some mechanism for weakening it to a lower-bounded reading.

## **Background on Slovenian Dual**

# Basics

Slovenian makes a 3-way number distinction: **singular**, **dual**, **plural**

'Town' (neuter)

	SG	DL	PL
NOM, ACC	mesto	mesti	mesta
DAT	mestu	mestoma	mestom
INSTR	mestom	mestoma	mesti
GEN	mesta	mest	mest

Masc. pronouns

NOM	SG	DL	PL	ACC	SG	DL	PL
1	jaz	midva	mi	1	mene	naju	nas
2	ti	vidva	vi	2	tebe	vaju	vas
3	on	onadva	oni	3	njega	njiju	njih

## Basics (cont.)

Determiners, adjectives, and verbs show dual agreement.

(4) **Ta**                      **dva**                      **stola**  
these.DL.M.NOM two.DL.M.NOM chair.DL.M.NOM

**sta**                      **polomljena**  
be.3.DL.PRES broken.DL.M.NOM

'These two chairs are broken.'

(Derganc 2003: 168)

Unmodified dual nouns tend to receive definite interpretations

(Jakopin 1966; see also Dvořák & Sauerland 2006).

(5) **Otroka**                      **hodita**                      **še v šolo.**  
children.DL.M.NOM go.3.DL.PRES still to school

'The two children still go to school.'

(Derganc 2003: 168)

# Paired Nouns

One peculiar property of Slovenian dual is that they are usually not used for entities that naturally come in pairs (**paired nouns**)

(Derganc 2003, Dvořák & Sauerland 2006, Sauerland 2008).

- (6) a. **Noge** me bolijo.  
foot.PL me hurt.3.PL.PRES  
'My feet hurt.'
- b. #**Nogi** me bolita.  
foot.DL me hurt.3.DL.PRES

<i>roke</i>	'hands'	<i>noge</i>	'feet'	<i>oči</i>	'eyes'
<i>čevlji</i>	'shoes'	<i>rokavice</i>	'gloves'	<i>starši</i>	'parents'

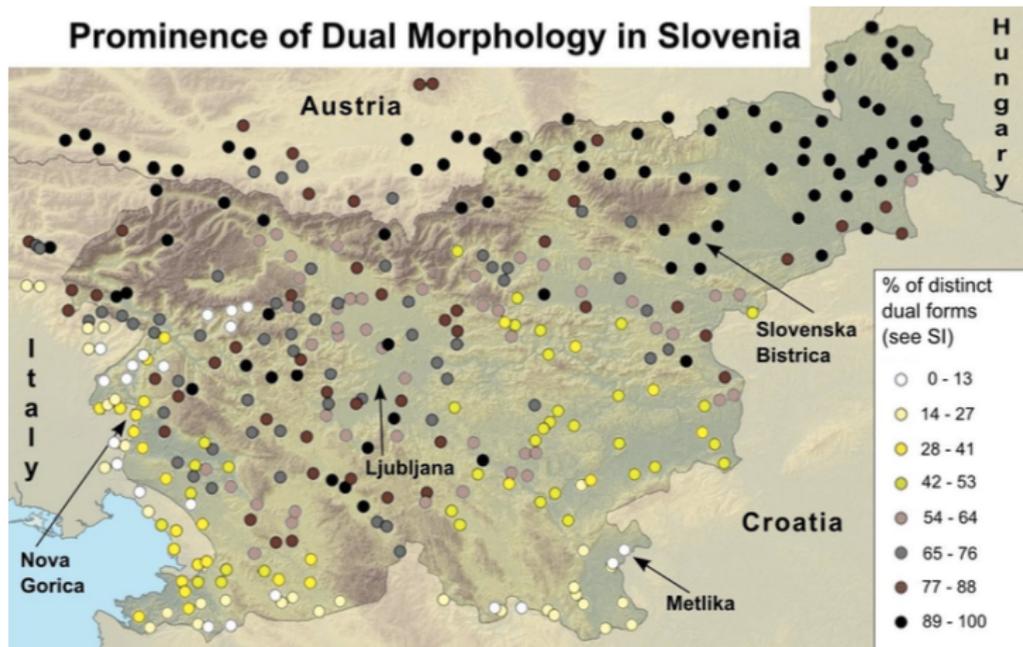
## Dva, Oba + DL

Modifiers like **dva** 'two' and **oba** 'both' always require dual nouns, even with paired nouns (Deganc 2003, Dvořák & Sauerland 2006).

- (7) **Dva**                      **otroka**                      hodita                      še v šolo.  
two.DL.M.NOM child.DL.M.NOM go.3.DL.PRES still to school  
'Two children still go to school.'  
(Deganc 2003: 168)
- (8) **Obe nogi**      me bolita.  
both foot.DL me hurt.3.DL.PRES  
'Both my feet hurt'  
(Deganc 2003: 172)

# Note: Dialectal Variation

There is considerable dialectal variation (Marušič, Žaucer, Plesničar, Razboršek, Sullivan & Barner 2016; see also Jakop 2008).



## **Previous Studies**

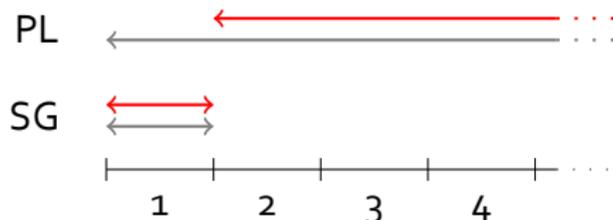
# Number Competition

Dvořák & Sauerland (2006) and Sauerland (2008) extend Sauerland's (2003) theory of number to DL in Slovenian.

## Sauerland (2003):

- ▶ SG in English is only compatible with singular reference, while PL is semantically number neutral. (SG is stronger than PL)
- ▶ PL triggers a pragmatic competition with SG, and generates additional inference.

(9) I bought *expensive books*. ↪ not singular reference



## Number Competition: Partial Plurality Inference

Sauerland (2003) can deal with partial plurality inferences:

(10) Every applicant submitted *their experimental papers*.

The singular version, (11), presupposes that every applicant has exactly one paper.

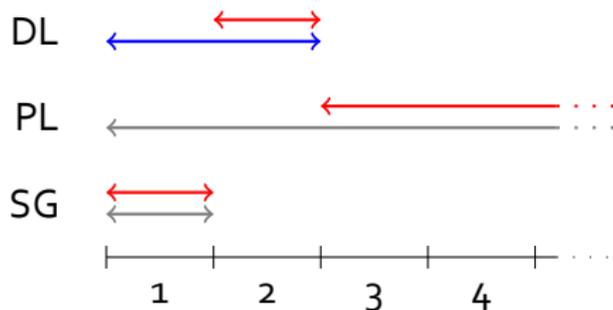
(11) Every applicant submitted *their experimental paper*.

(10) competes with (11) and generates an inference that the presupposition of (11) is not satisfied.

# Upper-Bounded Semantics for Dual

Dvořák & Sauerland (2006) and Sauerland (2008) propose that in Slovenian:

- ▶ SG and PL have the same semantics as in English.
- ▶ DL is semantically compatible with singular and dual reference.
- ▶  $\therefore$  SG > DL > PL.
  - ▶ DL is used when SG cannot be used.
  - ▶ PL is used when both SG and DL cannot be used.



## Sauerland's (2008) examples: Ignorance

Sauerland (2008) presents (12) as support for the analysis:

(12) Context: *I want to have someone over for dinner but I only have enough food to invite either **Bill and his brother** or **only John**.*

Naj *pride-ta* točno ob osmih.

PRT come.3.DL exactly at 8.LOC

'They.DL should come at 8 o'clock.'

The idea is that the presupposition of SG is not satisfied here, but that of DL is.

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However, 3 native speakers we consulted do not agree with the reported judgments.

## Sauerland's (2008) examples: Quantification

Sauerland (2008) gives another relevant example:

(13) Context: *Every student brought one or two books.*

Vsak študent je prinesel s seboj

{	a.	<i>svoj-o knjig-o</i>	(SG)
	b.	<i>svoj-i knjig-i</i>	(DL)
	c.	<i>svoj-e knjig-e</i>	(PL)

every student aux brought with self self's book(s)

'Every student brought his book(s)'

He reports that PL is # in this context, while SG and DL are acceptable.

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We asked 30 speakers to judge (13):

- ▶ SG: 48% acceptance
- ▶ DL: **0% acceptance**
- ▶ PL: 62% acceptance

## Marušič et al. (in progress)

Marušič, Žaucer, Saksida, Sullivan, Skordos, Wang & Barner's (in progress) acquisition study shows that children acquiring Slovenian (4.5-6 y.o.) do understand bare DL indefinites as referring to exactly two things, treating them similarly to 'two Ns'.

Comparison to English learning children and younger children (2-3 y.o.) suggests that mastery of DL leads to a bilateral ('exactly 1') reading of bare SG indefinites.

~> **DL indefinites seem to have a stronger semantics than SG indefinites.**

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↪ **DL indefinites seem to have a stronger semantics than SG indefinites.**

Note that Marušič et al.'s idea is compatible with the lower-bounded semantics as well as with the exact semantics for DL.

$$\left. \begin{array}{l} \exists x[P(x) \wedge |x| \geq 2] \\ \exists x[P(x) \wedge |x| = 2] \end{array} \right\} \text{ iff there are at least 2 } P\text{-things}$$

# Theoretical Questions

Recall the theoretical possibilities (cf. the semantics of numerals):

1. **Bilateral** ('exactly 2')
2. **Lower-bounded** ('at least 2')
3. **Upper-bounded** ('1 or 2') (Dvořák & Sauerland 2006, Sauerland 2008)

The evidence so far speaks against **3**.

Marušič et al. (in progress) suggest suggest **1**. or **2**.

Is SG and PL in Slovenian like SG and PL in English?

# **Acceptability Judgment Experiment**

Definite duals with bound variables in 3 types of contexts:

(14) Vsak moški je opral svoj-a avtomobil-a.

Every man aux washed self's-DL cars-DL

'Every man washed his.DL cars.DL.'

- ▶ [1 or 2]: Some men have exactly 1 car, the others have exactly 2.
- ▶ [2 or 3]: Some men have exactly 2 cars, the others have exactly 3.
- ▶ [exactly 2]: Every man has exactly 2 cars.

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Contexts were introduced in a question, e.g. 'Can one use this sentence in a situation where some men have one car and some men have two cars?', and answers were given by *ja* 'yes' or *ne* 'no'.

Also tested versions of the sentences where the relevant noun is in **SG**, in **PL**, and in **DL with the numeral *dva* 'two' (NUM)**.

# Predictions

Predictions of theories for DL:

- ▶ **Bilateral semantics** ('exactly 2'): DL is accepted only in [exactly 2].
- ▶ **At-least semantics** ('at least 2'): DL is accepted in [2 or 3] and [exactly 2], but not in [1 or 2].
- ▶ **At-most semantics** ('1 or 2'): DL is accepted in [1 or 2] and [exactly 2], but not in [2 or 3].

Comparison to NUM will be informative here, given that a numeral is assumed to be lower-bounded ('at least') and/or bilateral ('exact')

(Horn 1972, Geurts 2006, Breheny 2008, Spector 2013).

⇒ NUM shouldn't be accepted in [1 or 2], and perfect in [exactly 2].  
Perhaps intermediate in [2 or 3].

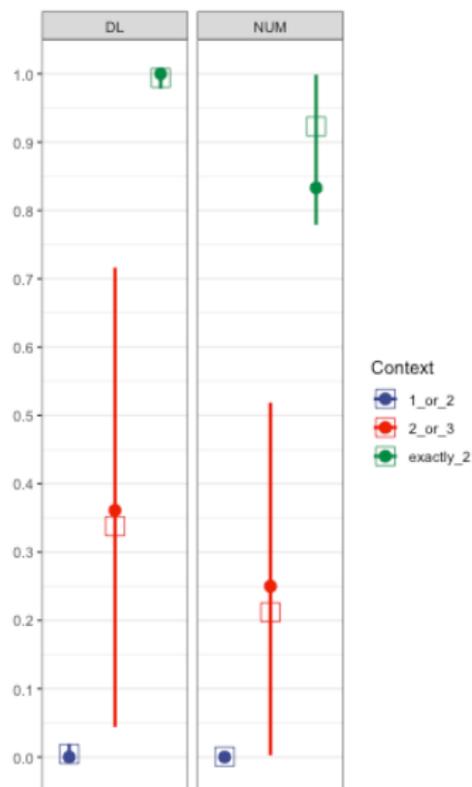
# Procedure

Each participant was randomly assigned one of the three target contexts and saw all four types of number marking, 6 items each.

30 native speakers were recruited at the University of Ljubljana. 9 of them were excluded from the analysis for coming from areas where duals are not often used.

A Bayesian logistic mixed effects model with a weakly informative prior was fit to the data from the remaining 21 participants.

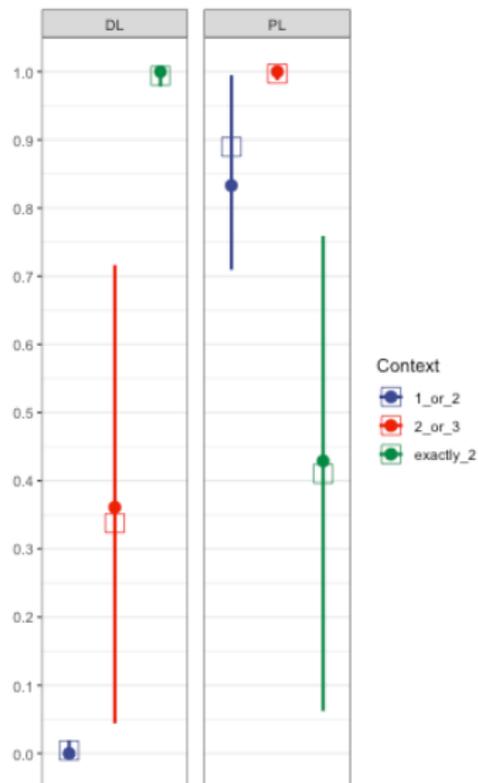
# Results: DL-NUM



## DL and NUM behaved similarly.

1. Unsurprisingly, perfect in [exactly 2].
2. Not accepted at all in [1 or 2].
3. Intermediate acceptance in [2 or 3]
  - ▶ 2.+3. are unexpected under **at-most semantics**.
  - ▶ 3. is unexpected under **at-least semantics** (esp. DL!).
  - ▶ 3. needs an explanation under **exact semantics** (see below).

# Results: DL-PL

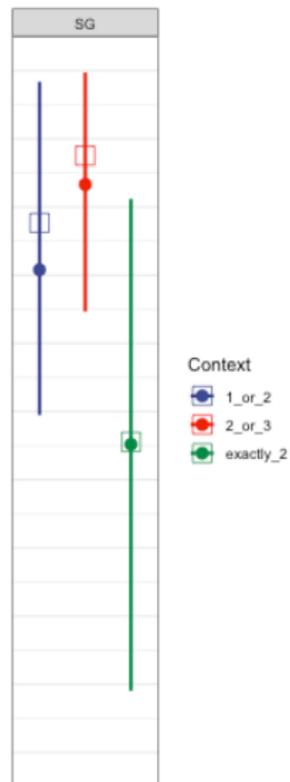


- ▶ PL is accepted in [1 or 2] and [2 or 3]
- ▶ PL is not perfect in [exactly 2].

These results suggest that PL is number-neutral (as in English), but competes with DL so not perfect in [exactly 2].

(cf. Marušič et al., in progress)

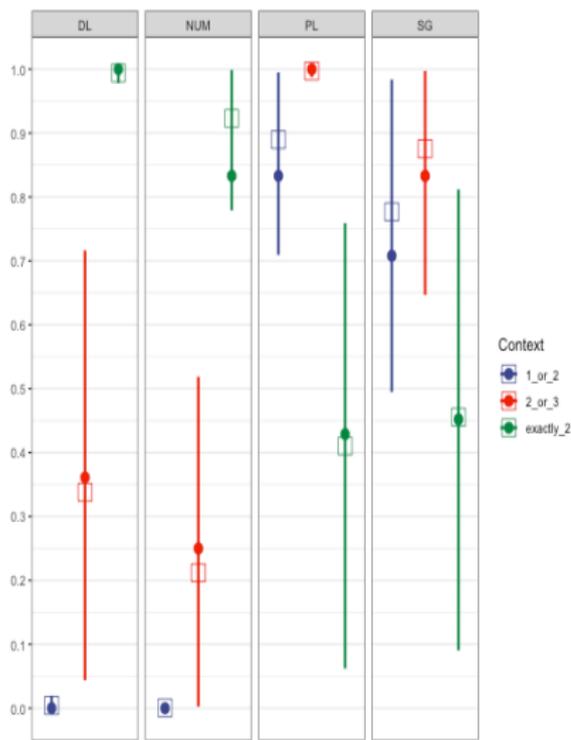
# Results: SG



The results for SG are unexpected under the view that the core semantics of SG is exactly one.

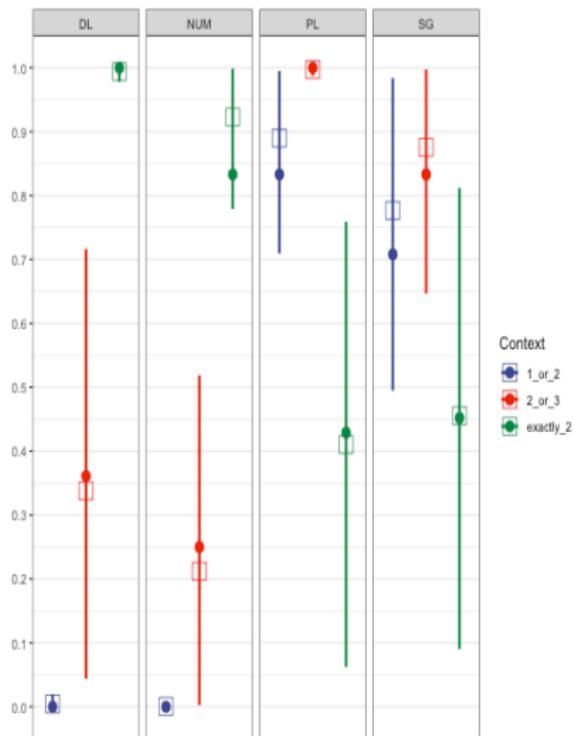
One way to make sense of this is to assume that SG in the Slovenian possessive construction can receive an indefinite interpretation (with some cost), e.g. 'a/one car of his'.

# Summary



- ▶ The results are clearly against the **at-most semantics** of DL.
- ▶ The behavior of PL in [1 or 2] and [2 or 3] suggests that PL is semantically number-neutral in Slovenian (as in English).
- ▶ The intermediate acceptance of PL in [exactly 2] suggests competition with DL.
- ▶ The results of SG can be understood as due to indefinite construal (with some cost).

# Implications on the Semantics of DL



- ▶ Given [exactly 2], DL should be more specific than PL.
- ▶ If **lower-bounded** ('at least 2'), why is DL not so good in [2 or 3]? Note that there's no more specific competitor (no trial!).
- ▶ The most sensible analysis is **bilateral** ('exactly 2') but can be weakened to 'at least 2' with some cost (cf. Breheny 2008). The mechanism behind the weakening might be indefinite construals of possessive constructions (e.g. 'two cars of his').

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