

Definiteness, uniqueness, and maximality in languages with and without articles

Radek Šimik, Christoph Demian (авторы)
И. Наумов, С. Михайлов (докладчики)
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In short

Goal of the paper: Experimentally test widespread hypotheses about the meaning of definite descriptions (in languages with articles) and bare nominals (in articleless languages).

Obtained result: The hypothesis that definites convey uniqueness/maximality *is supported*.

The hypothesis that bare nominals also do so *is not supported*.

Before proceeding to the main part, a few introductory words are in order...

Theories of definiteness (1)

- What is a singular definite description?
- A prominent answer (since Frege 1982 and Russell 1905):
 - A definite description is an expression that conveys that there is exactly one individual satisfying the description.
 - For most scholars, including our authors, the term “conveys” means essentially “presuppose” (Frege 1982; Strawson 1950; Elbourne 2013; contra e.g. Russell 1905, who argues for at-issue status of the implication).
 - Standard representation via ι -operator: The cat $\longrightarrow \iota x.CAT(x)$.
 - The authors also adopt Coppock & Beaver’s (2015) terminological convention:
 - DETERMINATE interpretation — expressions of type e (including definites);
 - INDETERMINATE interpretation — expressions having the denotation of an existential quantifier (not! excluding definites: ‘Maria didn’t give the only invited talk at the conf.’).

Theories of definiteness (2)

- The presupposition of singular definite descriptions is called UNIQUENESS presupposition. Then the sentence in (1) is said to come with the presupposition that *there is exactly one cat of which the predicate is true*.

(1) The cat slept. \longrightarrow SLEPT(ιx .CAT(x))

- As authors further state, the UNIQUENESS THEORY of **singular** definites usually comes with the MAXIMALITY THEORY of **plural** definites, according to which plural definites refers/denotes the *maximal entity* that satisfies the description.
- Standard representation via σ -operator: The cats \longrightarrow σx .CATS(x).
- Similarly, the sentence in (2) is said to come with the presupposition that *the predicate is true of the maximal entity*.

(2) The cats slept. \longrightarrow SLEPT(σx .CATS(x))

- Note that UNIQUENESS is a special case of MAXIMALITY (and thus we might use one umbrella notion).

Articleless languages (1)

- Standard assumption: in Russian, it is possible to express the above meanings by (3a) and (3b), respectively. Some people would even argue that, due to the pre-verbal position of S, these interpretations are *necessary*.

(3) a. Koska spala
cat slept
'The cat slept.'

b. Koski spali
cats slept
'The cats slept.'

- But bare NPs can also easily correspond to indefinites:

(4) a. Na kovrike lezala koska
on mat lay cat
Available: 'There was a cat lying on the mat.'

b. Na kovrike lezali koski
on mat lay cats
'There we cats lying on the mat.'

- It is commonly assumed that the denotation of bare NPs is obtained via general type-shifting mechanisms and that there are various restrictions on possible meanings and/or type-shifts...

Articleless languages (2)

- Heim (2011: 1006): the fact that in articleless languages bare NPs can have both definite and indefinite interpretations is due to that they *always denote existential quantifiers*.
- The can be used in contexts which satisfy definiteness requirements because there are no definite counterparts to block them. How does it work? The first thing to note is that a sentence with a definite NP *asymmetrically entails* the corresponding sentence with an indefinite NP, (5).

- (5) a. The cat slept on the couch.
b. A cat slept on the couch.

- In languages with articles, in some contexts replacing a definite NPS with an indefinite leads to infelicity: using the form with a weak meaning implicates that CG does not support the requirement imposed by the form with a strong meaning, (6).

- (6) The bicycle was fine after...

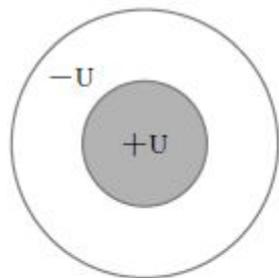
...^{OK}the seat was replaced / #a seat was replaced.

Articleless languages (3)

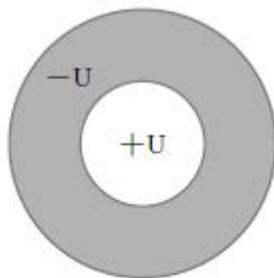
- As anti-uniqueness is not always drawn (e.g. (5b)), we can conclude that it is pragmatic in nature and indefinites themselves do not convey that there are multiple witnesses.
- This means that in the absence of a definite article there is nothing that could generate anti-uniqueness inference and bare NPs are felicitous in context satisfying UNIQUENESS, (7).

(7) 'The bicycle was fine...'

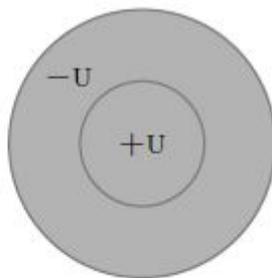
... posle togo kak zamenili sedlo.



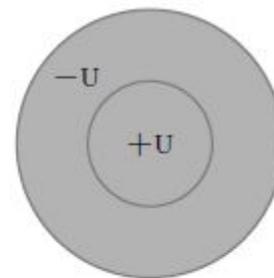
The cat slept



A cat slept +I



A cat slept -I



Koška spala

Figure 1: Definite, Indefinite $\pm I$ (MPLICATION), Bare

Dayal (2004) (1)

Main proposal: Bare NPs correspond to definites (if singular).

- Following Chierchia (1998), she assumes that nominals in Russian are “born” either as property denoting ($\lambda x[\text{CAT}(x)]$) or as kind denoting ($\hat{\text{CAT}}$). The former is applicable to bare NPs in predicative positions, (8), and the latter – in those such as (9).

(8) a. Murka koska
‘Murka is a cat.’

b. Vasilisa i Murka koski
‘Vasilisa and Murka are cats.’

(9) a. Koska byla prirucena 9000 let nazad
‘The cat was domesticated 9000 years ago.’

b. Koski rodstvenniki tigrov
‘Cats are related to tigers.’

- In contexts of entity-selecting predicates, as in (10), the property needs to be either shifted to an entity (via ι/σ) or to an existential quantifier:

(10) Na stupenkax {sidela koska / sideli koski}

IOTA/SIGMA shift: a. {The cat was / the cats were} sitting on the stairs.

EX-shift: b. {A cat was / cats were sitting on the stairs}

Dayal (2004) (2)

- As Dayal (2004) herself acknowledges, this solution would over-generate: the range of meanings derived by EX-shift is broader than attested. Specifically, contrary to what is predicted, (12a-b) cannot have a reading in which the bare NP receives the widest scope.

(12) a. Kot ne sidit na stule.

(i) 'The cat is not sitting on the stool.'

(ii) 'There isn't any cat sitting on the stool.'

(iii) *'A cat is not sitting on the stool.'

$\neg > \exists$
 $*\exists > \neg$

b. Mne kazetsja, što v komnate myš

(i) 'The mouse seems to me to be in the room.'

(ii) 'It seems to me that there's a mouse in the room.'

(iii) *'A mouse seems to me to be in the room.'

SEEM > \exists
 $*\exists > SEEM$

- Departure:** I personally have some problems both with judgments and interpretations.

Dayal (2004) (3)

- Dayal (2004) responds to these facts by banning EX-shift altogether: bare NPs in articleless languages either refer to kinds (directly or by nom-shift, turning properties to kinds) or to particulars (by IOTA-shift).
- This solves the problem with (12a-iii) and (12b-iii) but creates a new one: how to account for the interpretation in (ii)? As we have already excluded EX-shift, the only available option is IOTA-shift. Dayal (2004) proposes that these apparently narrow-scope existentials are actually determinate NPs but with two provisos:
 - determinate bare NPs, as opposed to definite descriptions, do not presuppose that their referent is familiar;
 - the uniqueness presupposition introduced by the iota-shift|might not be able to project across operators such as negation (which could in turn be related to the lack of familiarity).
- But this solution itself comes with a number of problems (as Nathan Klinedinst points out): If uniqueness fails to project across negation, how (i) is derived? Why should narrow-scope determinate be paraphrased as an existential quantifier?

Geist (2010) (1)

Main proposal: Bare NPs are ambiguous (if not topics).

- In contrast to Dayal (2004), Geist (2010) does not block EX-shift. However, he also acknowledges that the interpretation of bare NPs is more restricted than existential quantifiers.
- He argues that this restriction follows from the failure to reduce the domain of quantification to a singleton. It can be reduced if there is an explicit determiner, such as the unstressed version of the numeral *odin* ‘one’, (cf. 13a and 13b).

- (13) a. Dzon xocet zenitsja na francuzenke
‘John wants to marry a French woman (not a particular one).’
- b. Dzon xocet zenitsja na odnoj francuzenke
‘John wants to marry a French woman (a particular one).’

- This is based on Schwarzschild (2002), who argues that apparently wide-scope indefinites are indefinites restricted to the domain containing only one individual.

Geist (2010) (2)

- In addition, Geist (2010) is concerned with the observation (well-known) that preverbal bare NPs – in contrast to post-verbal ones – cannot correspond to indefinites, (14).

- (14) a. Kniga lezit na tom stole
(i) 'The book is lying on that table.'
(ii) Unavailable: 'A book is lying on that table.'
- b. Na tom stole lezit kniga
(i) 'The book is lying on that table.'
(ii) 'A book is lying on that table.'

- He derives this from a number of premises:
 - a. Bare NPs can be indeterminate (via EX-shift) or determinate (via iota-shift).
 - b. Indeterminate bare NPs must be non-specific.
 - c. Preverbal bare NPs are (usually) topics.
 - d. Topics must be specific (in the sense of being determinate; Reinhart 1981).

Summing up

We have discussed three proposals on what bare NPs mean:

- Heim's (2011): bare NPs in articleless languages are always indeterminate, but due to the lack of anti-uniqueness implicatures, nothing prevents them from being used in situations where a definite description would be appropriate.
- Dayal (2004): singular bare NPs are always determinate and presuppose uniqueness (unless embedded under certain operators). "Indefiniteness intuitions" arise due to the lack of familiarity requirement.
- Geist (2010): pre-verbal bare NPs cannot correspond to indefinites because, unless stressed, they topics and topics must be specific.

Predictions of the discussed theories

The discussed theories make the following predictions:

- Heim (2011): does not predict any uniqueness/maximality implications in bare NPs.
- Dayal (2004): uniqueness is predicted for singulars, but maximality is not predicted for plurals (but for the reasons of time and space we omitted Dayal's (2004) discussion of plurals).
- Geist (2010): uniqueness / maximality is predicted for preverbal unstressed bare NPs, but not for stressed (pre- or post-verbal) bare NPs.

	Heim (2011)	Dayal (2004)	Geist (2010)
PREVERBAL UNSTRESSED	X	✓	✓
SG POSTVERBAL STRESSED	X	✓	X
PREVERBAL STRESSED	X	✓	X
PREVERBAL UNSTRESSED	X	X	✓
PL POSTVERBAL STRESSED	X	X	X
PREVERBAL STRESSED	X	X	X

Experimental design

Experimental design: variables

Independent variables:

- definiteness (correlates)
 - presented linguistically
- uniqueness/maximality
 - presented visually

Dependent variable:

- choice of visible vs. covered picture

Tested:

- 1) interaction between definiteness and uniqueness/maximality in German
- 2) interaction between definiteness correlates (number, word order, prosody) and uniqueness/maximality in Russian

Experimental design: batches

- The design is the same for German and Russian
 - *modulo* definiteness correlates: articles in German; prosody, number, word order in Russian
- 7 experimental batches + fillers = 72 items

	Experiment batch	Number of items	ID numbers
1	MAIN	24	1–24
2	EXH	16	25–40
3	SCAL	8	41–48
4	BOTH	6	49–54
5	FOC	6	55–60
6	ONLY	4	61–64
7	ALSO	4	65–68
8	REST	4	69–72
	total	72	

Table 4: Overview of experiment batches

Experimental design: batches

	Experiment batch	Number of items	ID numbers
1	MAIN	24	1–24
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	total	72	

Which batch tests what:

Table 4: Overview of experiment batches

- MAIN: definiteness X uniqueness/maximality
- EXH: pragmatic exhaustification X word order, number, definiteness
- SCAL: **scalar implicature** of ‘some’ (as opposed to all)
- BOTH: cardinality inferences of ‘both’ (as opposed to ‘two’)
- FOC: exhaustification by “free” focus
- ONLY: **exhaustivity assertion** by focus associated with ‘only’
- ALSO: **additive presupposition** of ‘also’

Experimental design: batches

Multiple batches are needed:

1. to provide fillers for the MAIN batch
2. to balance the proportion of the two values of the dependent variable
3. to provide additional data for post-hoc comparison with main results

Experimental design: procedure

Covered box paradigm (Huang et al. 2013)

- relevant for detecting (i) less preferred interpretations
- (ii) less salient aspects of meaning (*i. e.* presuppositions)

Procedure:

1. Two pictures are presented (both “turned face down”)
2. The audio stimulus is presented: a short narrative with the final sentence being the target sentence
3. One of the pictures is turned face up and the participant must choose the “perfect match”
 - a. the participant is instructed that one of the pictures is an imperfect match

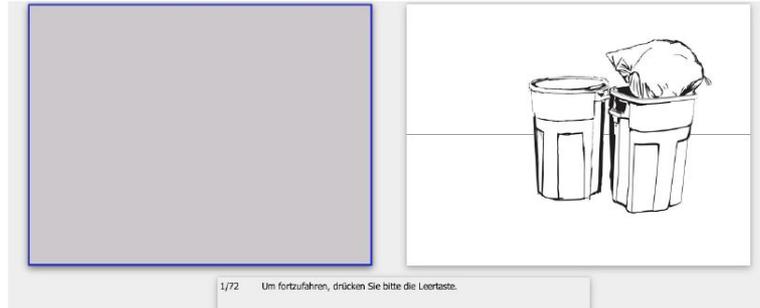
Experimental design: procedure

1. Two pictures are presented (both “turned face down”)
2. The audio stimulus is presented: a short narrative with the final sentence being the target sentence
 - () We threw away a lot of things during the cleaning up of our celar. **The other/second trashbin is now full, too.** (ALSO: ID 67)
3. One of the pictures is turned face up and the participant must choose the “perfect match”



Experimental design: procedure

4. The participant chooses one of the pictures.
If the covered one is chosen, it does **not** get disclosed.



5. The whole procedure is repeated for the next item.

Expectation: when the visible picture contradicts some aspects of meaning of the audio stimulus, there will be a higher proportion of covered picture responses

Experimental design: MAIN design

	Factor	Levels	Manipulation	Comments
1	LANGUAGE	German Russian	within items / between subjects	
2	WORD ORDER	S PRED PRED S	within items / within subjects	only within Russian
3	DEFINITENESS	definite indefinite	within items / within subjects	only within German
4	PROSODY	final stress initial stress	within items / within subjects	no crossing with WORD ORDER
5	NUMBER	singular plural	within items / within subjects	
6	PICTURE	+unique/maximal -unique/maximal	within items / within subjects	

Table 5: MAIN: Fixed factors and their levels

Experimental design: MAIN design

The main batch provides data substrate for five subexperiments, to test the following hypotheses:

1. definite descriptions convey uniqueness/maximality (in German)
2. number of bare NPs affects uniqueness/maximality implications (in Russian)
3. word order (in utterances with bare NPs) affects uniqueness/maximality implications (in Russian)
4. prosody affects uniqueness/maximality implications (in Russian)
5. compare strength of expected interactions in languages with and without articles (?)

Experimental design: MAIN design

Each subexperiment had a 2 X 2 design

- with PICTURE as the 1st factor in all subexperiments and
- DEFINITENESS, NUMBER, WORD ORDER, PROSODY as the 2nd in each subexperiment

Experimental design: MAIN design

One MAIN item ID 9 in all conditions for German.

	Target	DEFINITENESS	PROS. PROM.	NUMBER
1	Der Waggon hat sich ABGEKOPPELT.	def	final stress	sg
2	Ein Waggon hat sich ABGEKOPPELT.	indef	final stress	sg
3	Der WAGGON hat sich abgekoppelt.	def	initial stress	sg
4	Ein WAGGON hat sich abgekoppelt.	indef	initial stress	sg
5	Die Waggons haben sich ABGEKOPPELT.	def	final stress	pl
6	Waggons haben sich ABGEKOPPELT.	indef	final stress	pl
7	Die WAGGONS haben sich abgekoppelt.	def	initial stress	pl
8	WAGGONS haben sich abgekoppelt.	indef	initial stress	pl

Die Lokomotive musste anhalten. Der Waggon hat sich abgekoppelt.
the locomotive had.to stop.INF the carriage has REFL disconnected

Experimental design: MAIN design

One MAIN item ID 9 in all conditions for Russian.

	Target	WORD ORDER	PROS. PROM.	NUMBER
1	Otcepilsja VAGON.	PRED S	final stress	sg
2	Vagon OTCEPILSJA.	S PRED	final stress	sg
3	VAGON otcepilsja.	S PRED	initial stress	sg
4	Otcepilis' VAGONY.	PRED S	final stress	pl
5	Vagony OTCEPILIS'.	S PRED	final stress	pl
6	VAGONY otcepilis'.	S PRED	initial stress	pl

Lokomotiv dolžen byl ostanovit'sja. Otcepilsja vagon.
locomotive necessary was stop.INF.REFL disconnected.REFL carriage.NOM
'The locomotive had to stop. The/A carriage got disconnected.'

Experimental design: MAIN design

Each condition is further combined with one of the two pictures:

- +unique/maximal: the picture satisfies the uniqueness/maximality implication
- –unique/maximal: the picture doesn't satisfy the uniqueness/maximality implication

Experimental design: MAIN design

Shown for NUMBER:



(a) sg +unique



(b) sg -unique

Experimental design: MAIN design

Shown for NUMBER:



(c) pl +maximal



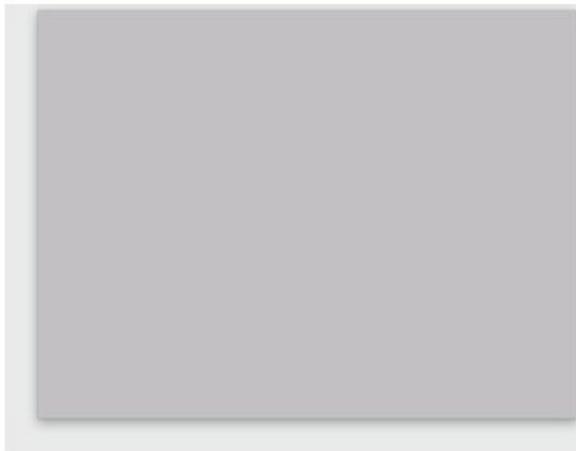
(d) pl -maximal

Experimental design: MAIN design (example)

A definite & final stress & plural audio stimulus:

Die Lokomotive musste anhalten. Die Waggons haben sich ABGEKOPPELT.
the locomotive had.to stop.INF the carriages have REFL disconnected
'The locomotive had to stop. The carriages got disconnected.'

A —unique/maximal picture:



MAIN experiments

MAIN experiments: DEF (hypothesis)

DEF: Hypothesis

Definite descriptions in German (a language with articles) convey uniqueness (singular) or maximality (plural).

MAIN experiments: DEF (results)

NB: absolute values are not part of the prediction

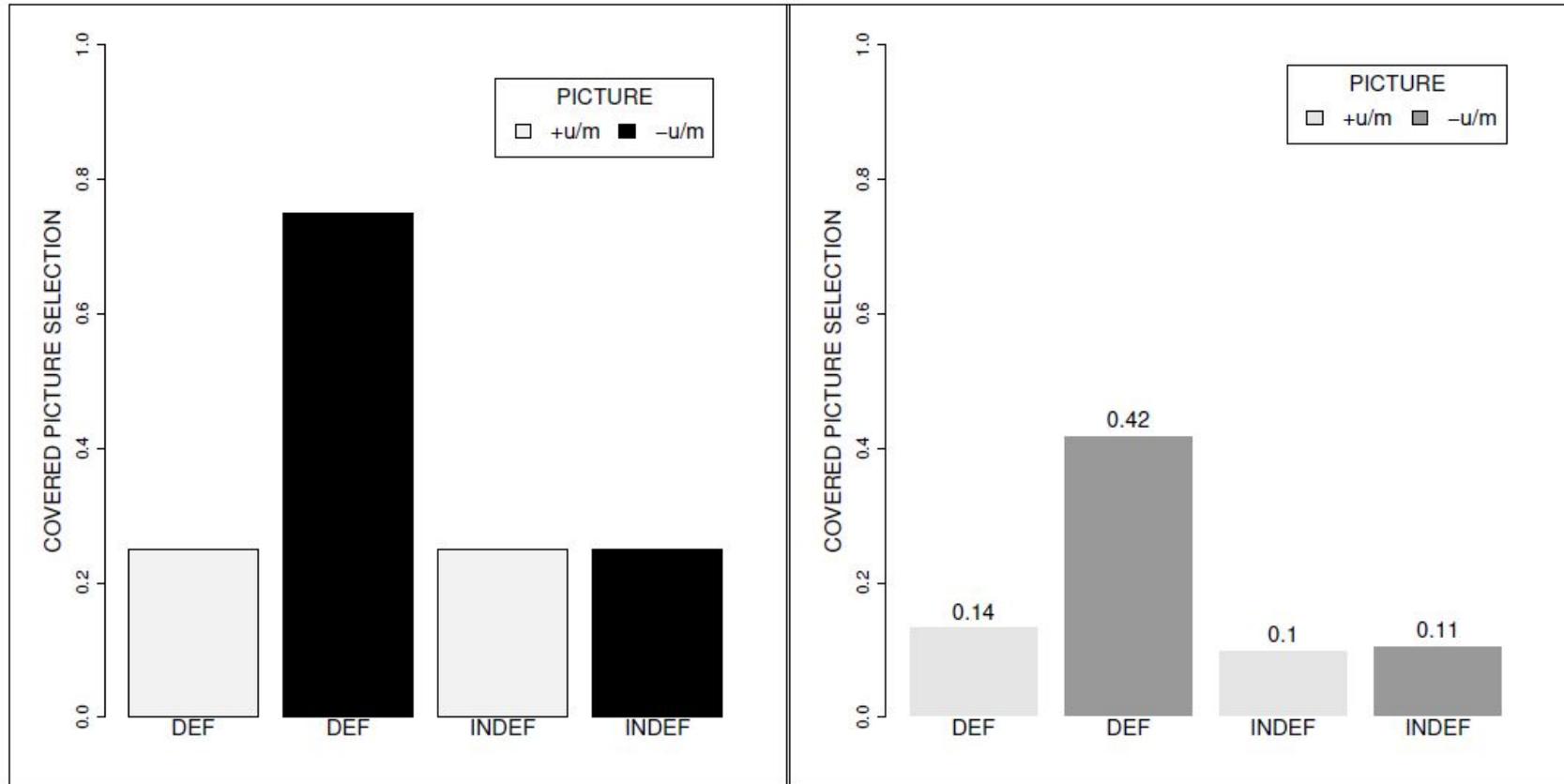


Figure 3: DEF prediction

Figure 4: DEF result

MAIN experiments: DEF (discussion)

DEF: Finding

Definite descriptions in German convey uniqueness/maximality.

What is striking (see Filler experiments and General discussion) is that the definiteness X uniqueness/maximality interaction is relatively weak.

- this might be attributed to the not-at-issue status of the uniqueness/maximality implication

No anti-uniqueness implicatures (Heim 1991, 2011; Sauerland 2008) in indefinite NPs

- this is hypothesized to be due to indefinites functioning as introducers of a referent (Heim 1982) in the +unique/maximal condition, which overrides any uniqueness/maximality inferences

MAIN experiments: NUM (hypothesis)

NUM: Hypothesis

Singular bare NPs in Russian (an articleless language) convey uniqueness, as opposed to plural bare NPs, which do not necessarily convey maximality (Dayal 2004, 2011).

MAIN experiments: DEF (results)

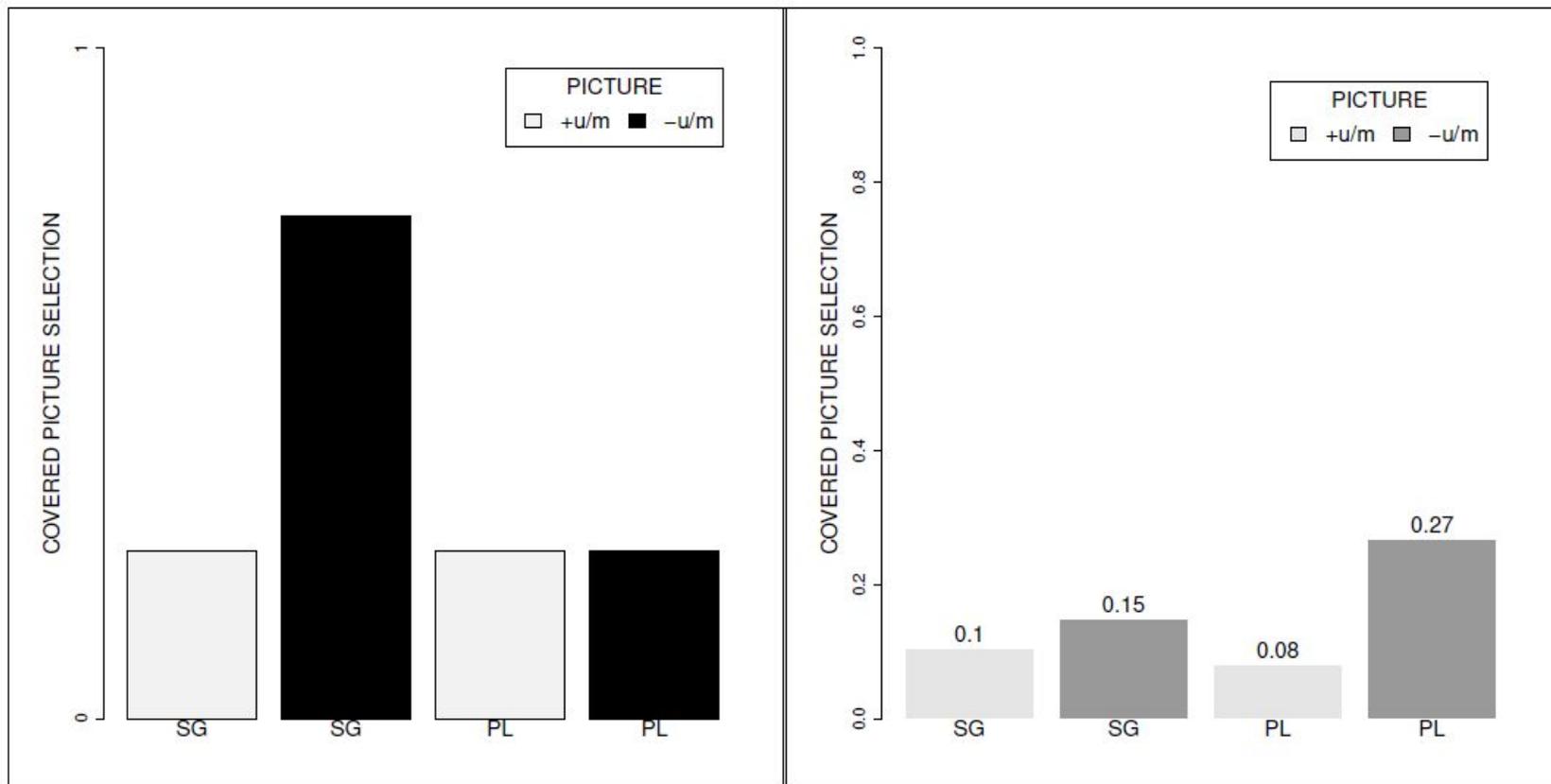


Figure 7: NUM prediction

Figure 8: NUM result

MAIN experiments: NUM (discussion)

NUM: Finding

We found no evidence for the hypothesis that singular bare NPs in Russian convey uniqueness. Unexpectedly, we found that plural bare NPs convey maximality, albeit very weakly so.

Dayal's (2004) prediction that singular bare NPs presuppose uniqueness **is not borne out**.

This result is in line with Heim's (2011) null hypothesis that bare NPs are simply indeterminate.

(For the effect of plurality on maximality see General discussion.)

MAIN experiments: WO (hypothesis)

WO: Hypothesis

Preverbal (\approx topical) bare NPs in Russian convey uniqueness/maximality, as opposed to postverbal (\approx non-topical) bare NPs (Geist 2010, among others).

MAIN experiments: WO (results)

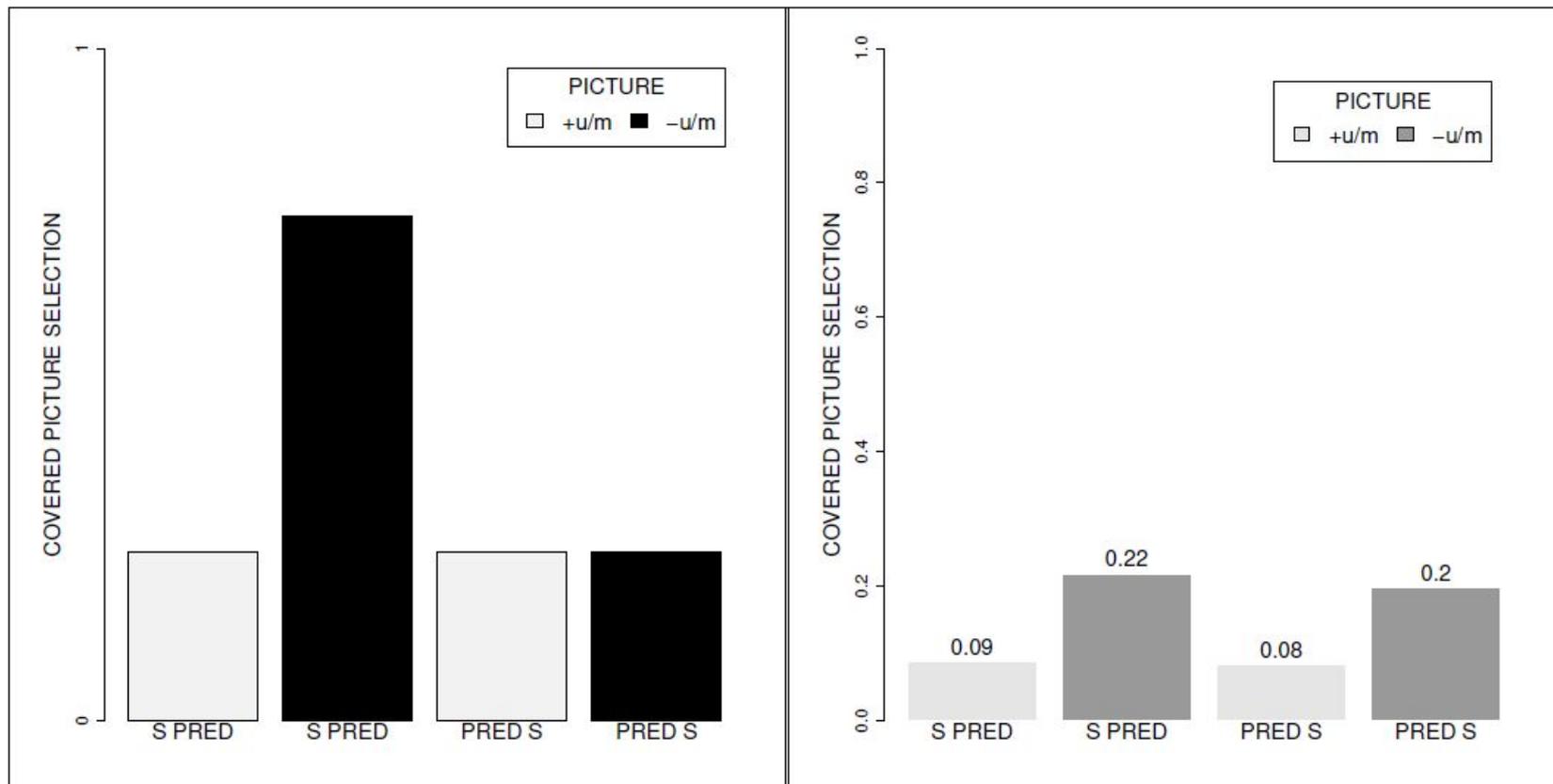


Figure 9: WO prediction

Figure 10: WO result

MAIN experiments: WO (post-hoc analysis)

The main effect of PICTURE is to due to plural bare NPs (in line with results of NUM).

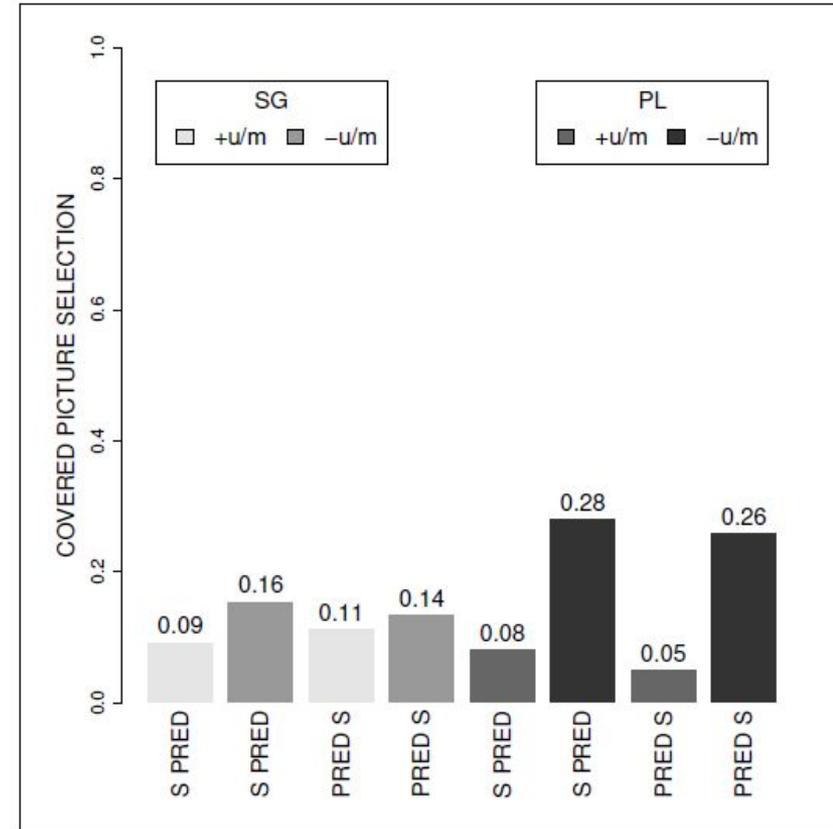


Figure 11: WO result divided by NUMBER

MAIN experiments: WO (discussion 1)

WO: Finding

We found no evidence for the hypothesis that preverbal bare NPs in Russian convey uniqueness or maximality.

This might be due to (i) the predecessors' intuition being wrong;

- this isn't likely, a recent corpus-study on Czech (Šimík & Burianová to appear) speaks in favor of this interaction being real.
 - (the authors assume that there is no significant difference between Russian and Czech in the relevant respects)

Maybe, (ii) WO manipulation failed to be interpreted as a topicality manipulation;

- maybe new topics are not interpreted as topics;
 - if theticity is much more context-dependent than sentence form dependent
- but this is contra Geist's (2010) assumption that preverbal bare NPs are topical independently of the context.

MAIN experiments: WO (discussion 2)

WO: Finding

We found no evidence for the hypothesis that preverbal bare NPs in Russian convey uniqueness or maximality.

Maybe, (iii) WO manipulations do correspond to definiteness manipulations, but uniqueness/maximality remains unaffected by it.

- This is possible, if the meaning of definiteness is based on some alternative notion, such as familiarity, non-ambiguity, or salience (see references in the paper).
 - Another experiment is needed to test whether these notions play a role.

Maybe, (iv) the experimental design wasn't sensitive enough;

- but this isn't likely in light of the filler experiments results.

MAIN experiments: PROS (hypothesis)

PROS: Hypothesis

Unstressed preverbal (\approx topical) bare NPs in Russian convey uniqueness/maximality, as opposed to stressed preverbal (\approx non-topical) bare NPs (Geist 2010, among others).

MAIN experiments: PROS (results)

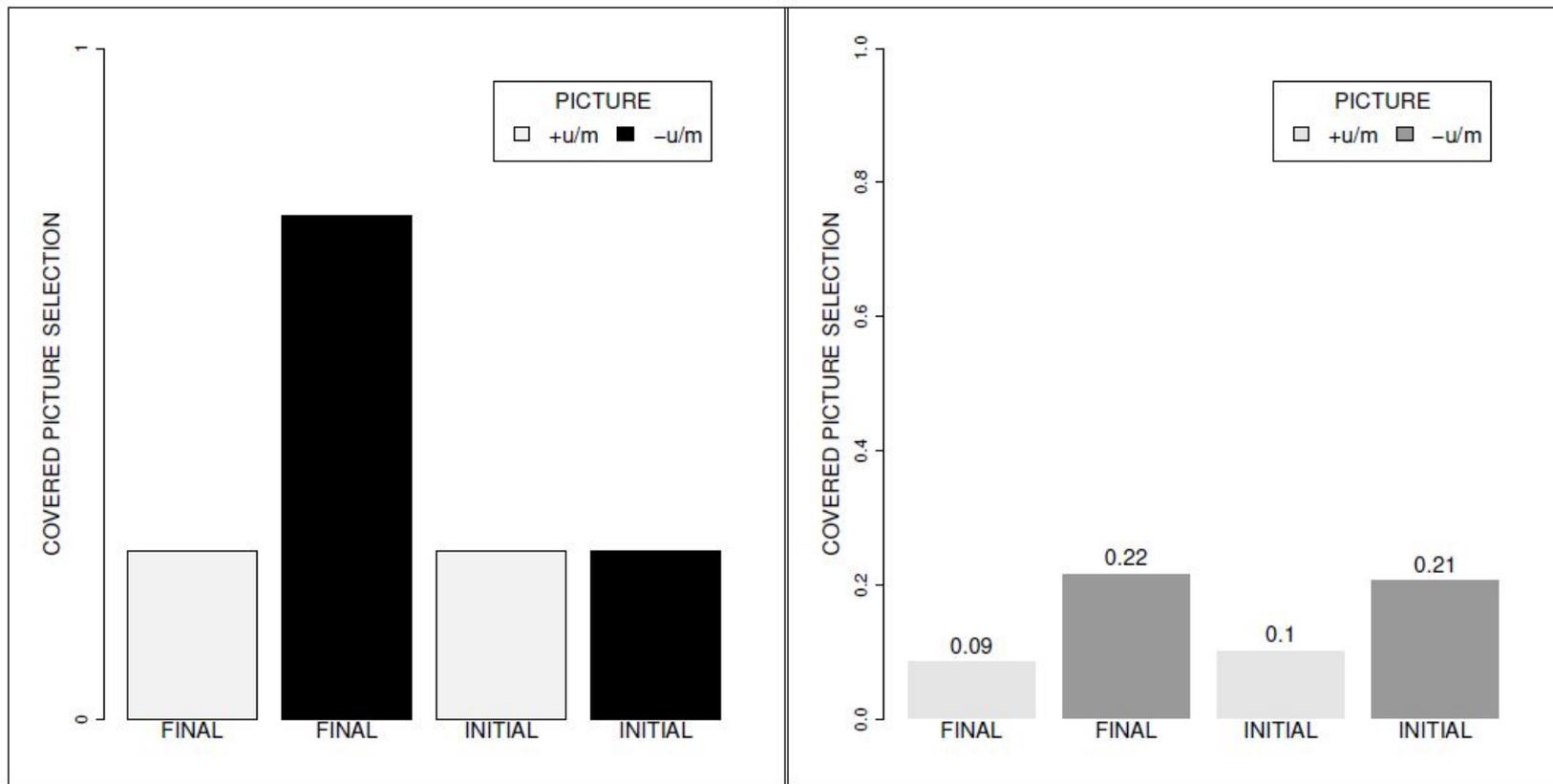


Figure 12: PROS prediction

Figure 13: PROS result

MAIN experiments: PROS (post-hoc analysis)

The main effect of PICTURE is to due to plural bare NPs (in line with results of NUM and just as in WO).

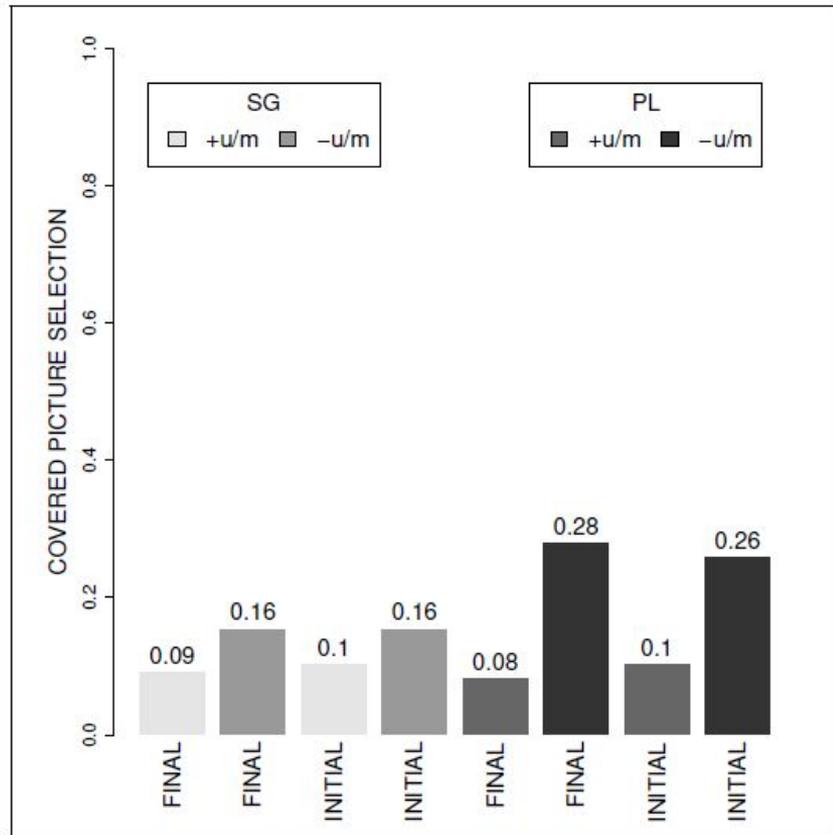


Figure 14: PROS result divided by NUMBER

MAIN experiments: PROS (discussion)

PROS: Finding

We found no evidence for the hypothesis that unstressed preverbal bare NPs in Russian convey uniqueness or maximality.

This reinforces the results of WO.

- No evidence for the hypothesis that uniqueness/maximality depend on topicality.

The same caveats apply:

- (i) the authors might have failed to manipulate topicality
- (ii) uniqueness/maximality might not be involved in determinate interpretations of bare NPs
- (iii) the experimental design might not have been sensitive enough

MAIN experiments: ART (hypothesis)

(How is this a hypothesis?)

ART: Hypothesis

Do definite articles in German interact with uniqueness and/or maximality more strongly than definite correlates in Russian do?

MAIN experiments: ART (results 1)

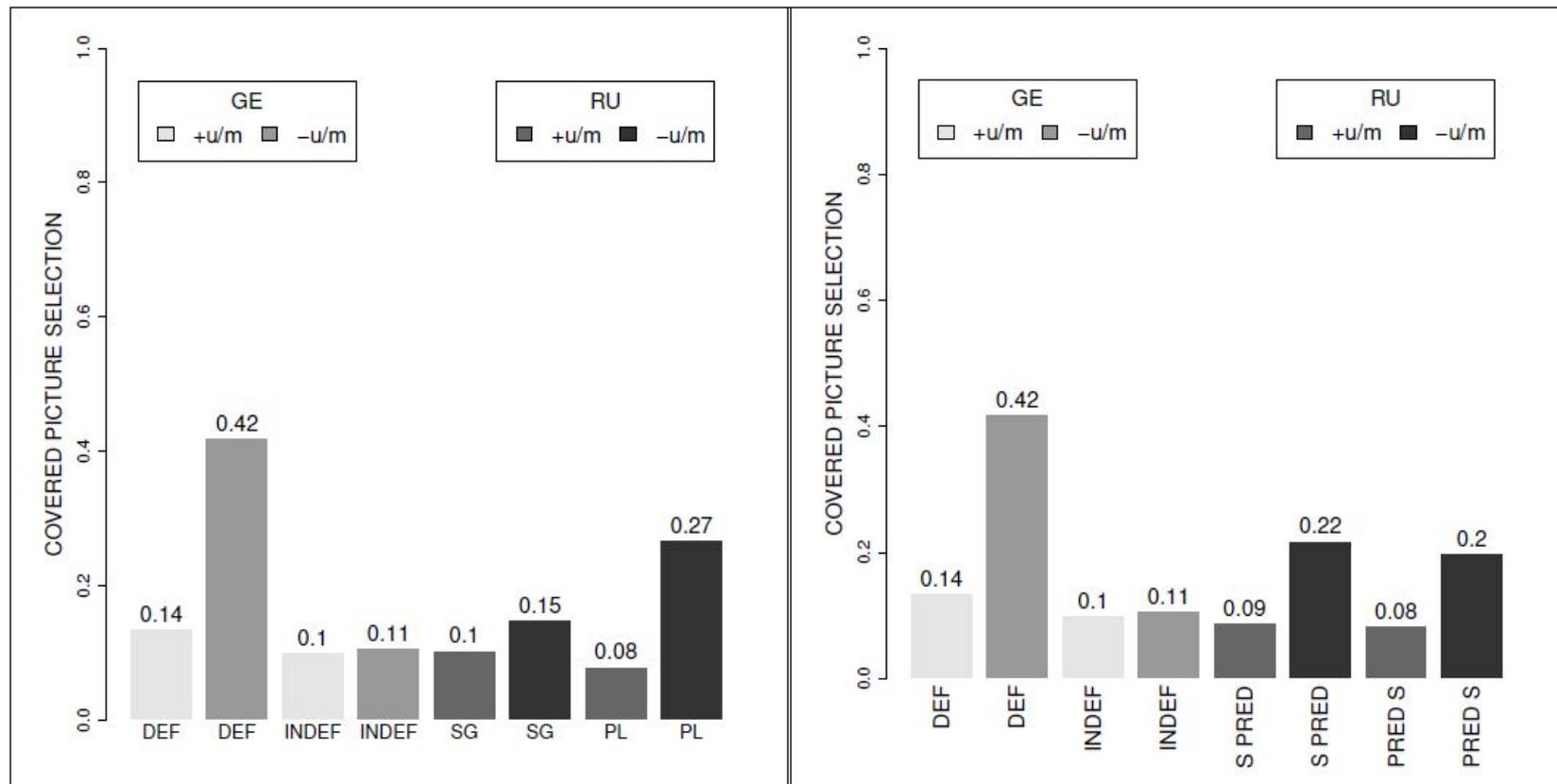


Figure 15: DEF \approx NUMBER

Figure 16: DEF \approx WORD ORDER

MAIN experiments: ART (results 2)

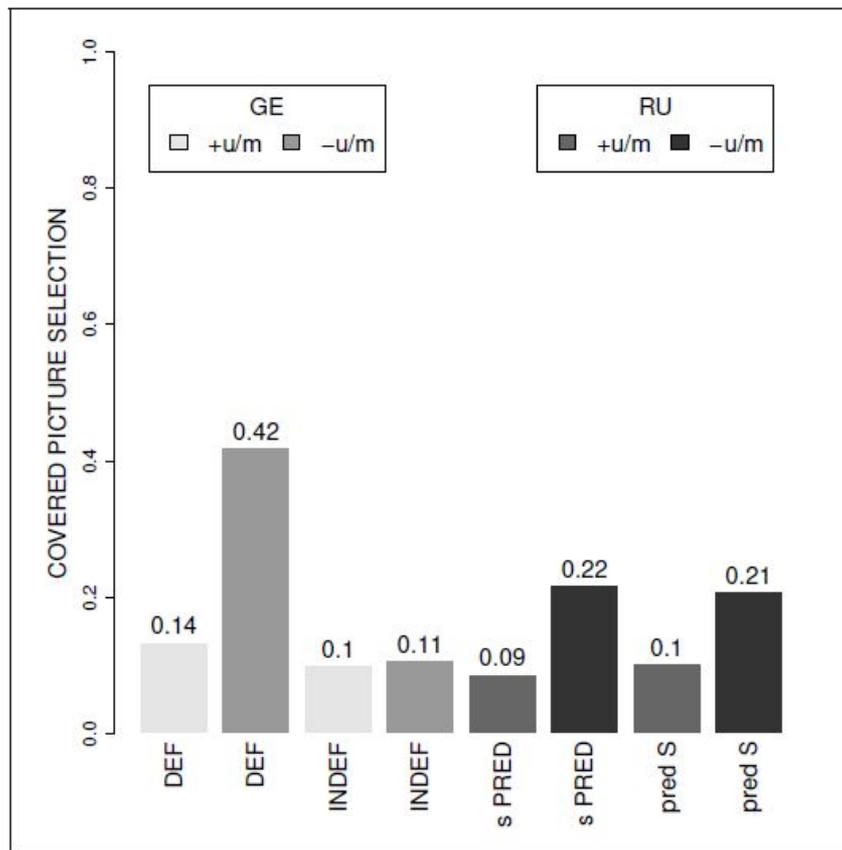


Figure 17: DEF \approx PROSODY

MAIN experiments: ART (discussion)

ART: Finding

Definiteness in German interacts with uniqueness/maximality more strongly than any of the definiteness correlates in Russian.

This is expected based on result from DEF and NUM, WO, PROS.

A post-hoc analysis with NUMBER recoded as pl \approx def, no significant interaction is found;

- *i. e.* German definite article behaves on a par with plurality in Russian!
 - (More work needs to be done to understand this result.)

Filler experiments

Filler experiments: outline

- Fillers were distributed among a number of experiment batches, and they tapped into the whole various inferences:
 - purely pragmatic and focus-induced exhaustification (EXH, FOC);
 - scalar implicatures triggered by SOME (SCAL);
 - determiner- or particle-triggered presuppositions (BOTH, ALSO);
 - at-issue exhaustive assertions (ONLY).

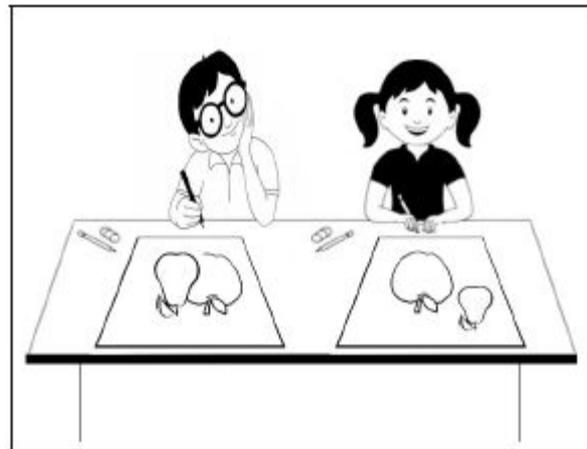
Purpose: to provide grounds for comparing the size of the effects brought about by UNIQUENESS/MAZIMALITY violations (which are, by hypothesis, contradictions of presuppositions) and by other types of violations (contradictions of implicatures, assertions, ...).

ONLY: structure

- The ONLY experiment tested the participants' sensitivity to the contradictions of the exhaustivity assertion introduced by the focus sensitive particle 'only', in particular, situations where a sentence of the form 'only x is such that P(x)' is accompanied by a picture depicting that P(x), but also that P(y) (where $x \neq y$).
- The manipulated factor was PICTURE, which had two levels: -EXHAUSTIVE and + EXHAUSTIVE.
- An example of the sentence in Russian in the -EXHAUSTIVE condition:

(17) Anja i Kolja polucili zadanije narisovat' frukty.

Anja narisovala tol'ko jabloko.



ONLY: results

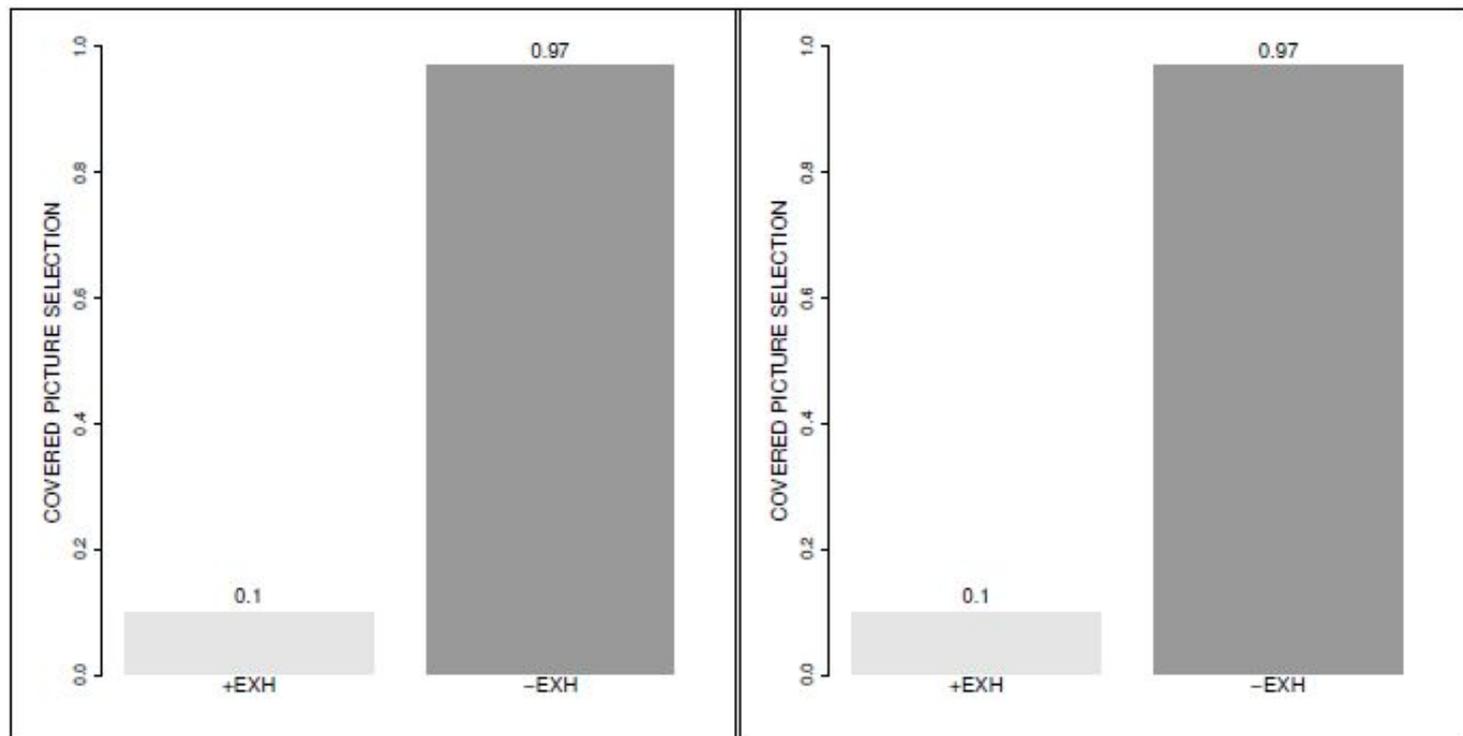


Figure 19: ONLY result German

Figure 20: ONLY result Russian

ALSO: structure

- The ALSO experiment tested the participants' sensitivity to contradictions of the additive presupposition introduced by the focus sensitive particle 'also', in particular, situations where a sentence of the form 'also x such that P(x)' does not verify the additive presupposition of 'also'.
- The manipulated factor was PICTURE, which had two levels: -ADDITIVE and +ADDITIVE.
- An example of the sentence in Russian in the -ADDITIVE condition:

(18) Julja i Sasha guljali, kogda stalo xolodnee.

Sasha toze nadel sapku.



ALSO: results

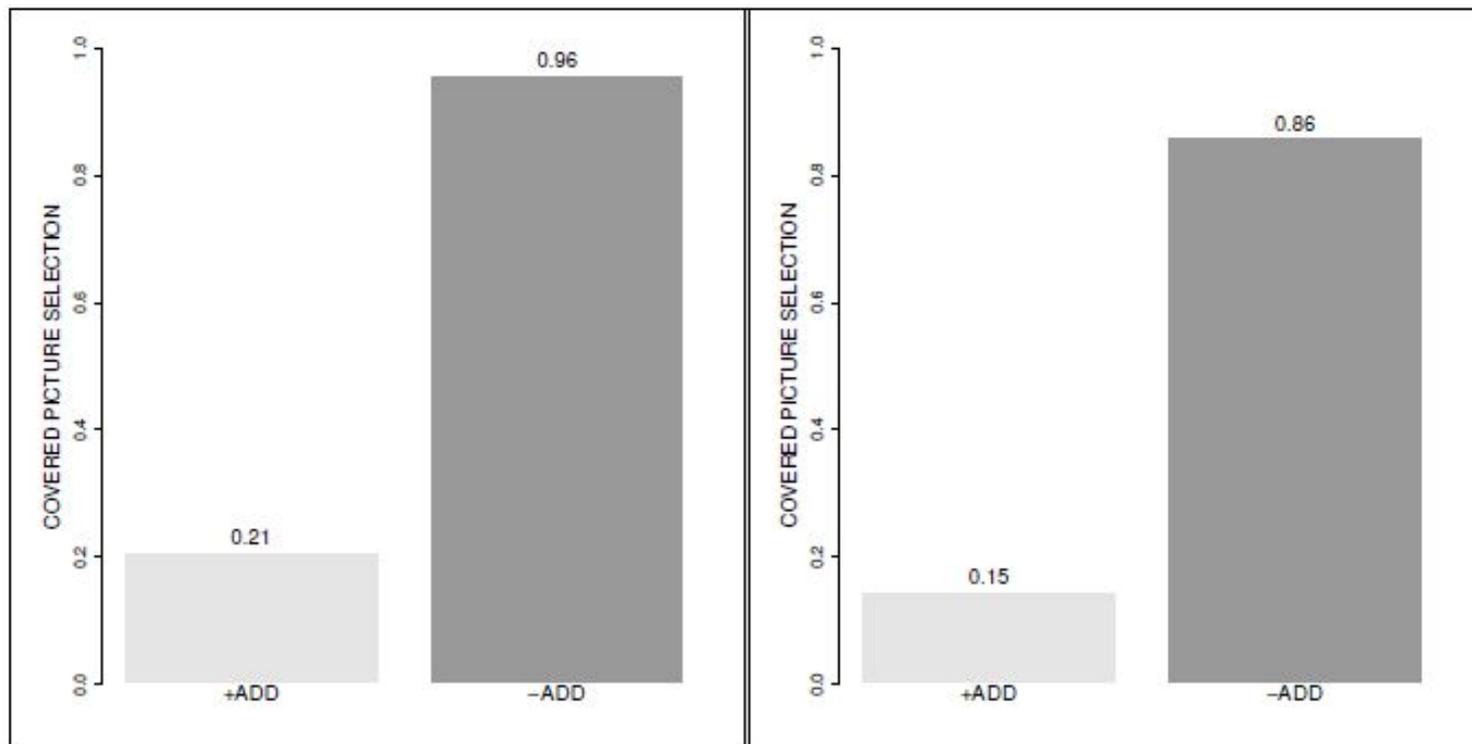


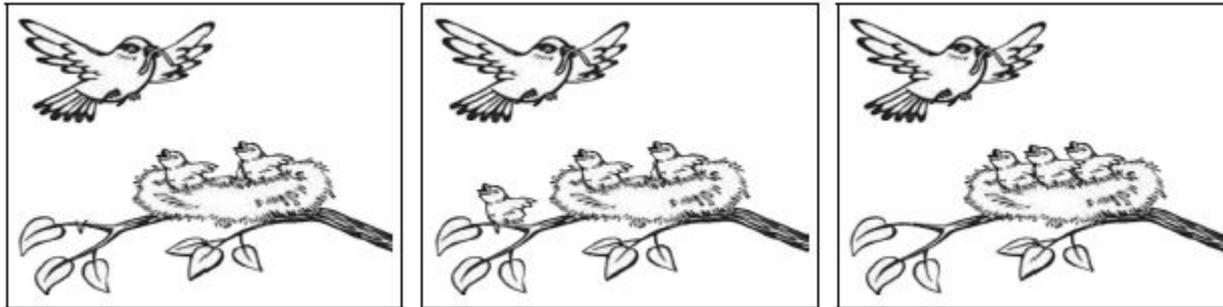
Figure 22: ALSO result German

Figure 23: ALSO result Russian

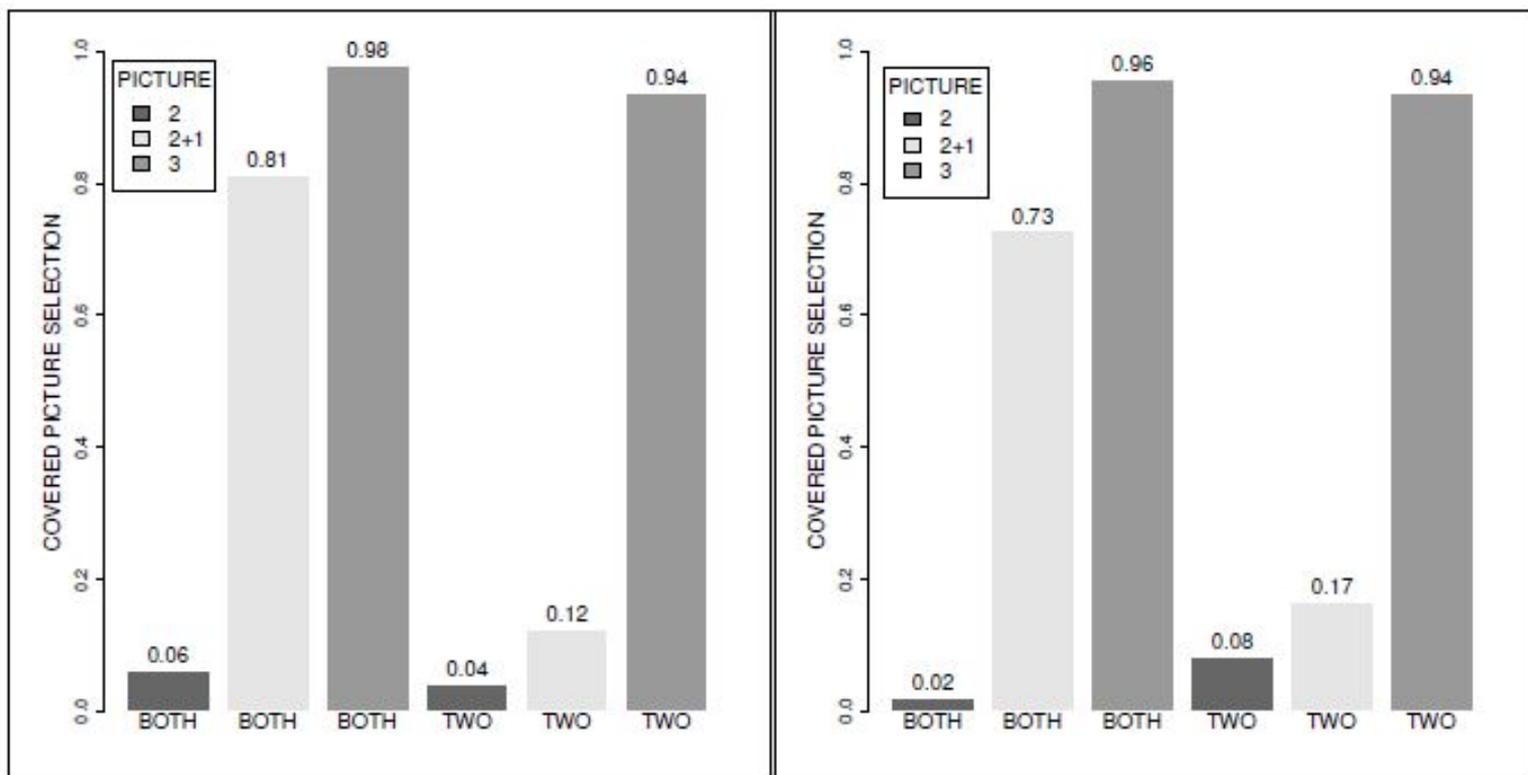
BOTH: structure

- The BOTH experiment tested the participants' sensitivity to contradictions of the cardinality assertion/presupposition/implicature associated with the numerals `both'/'two'.
- There were two manipulated factors: NUMERAL TYPE (both vs. two) and PICTURE (2-pic vs. 2+1-pic vs. 3-pic).
- An example of the sentence in Russian:

(19) Samka letela nazad k svoemu potomstvu. **Oba / dva ptenca sideli v gnezde.**



BOTH: results

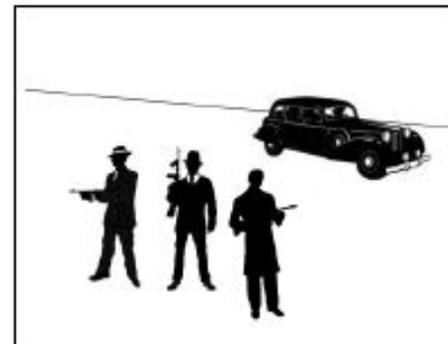
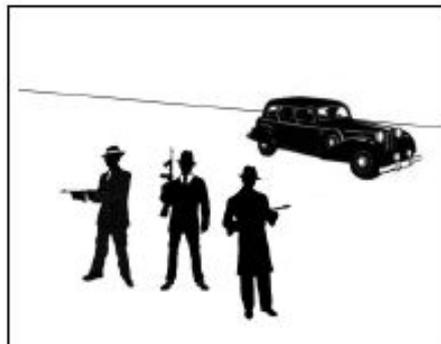


SCAL: structure

- The experiment tested the participants' sensitivity to contradictions of the implicature triggered by the determiner 'some', in comparison to contradictions of the assertion conveyed by the determiner 'all'.
- There were two manipulated factors: DETERMINER (some vs. all) and PICTURE (-all vs. +all).
- An example of the sentence in Russian:

(20) Na cernoj mashine priexali tri gangstera.

Vse / nekotoryje byli v shljapax.



Scal: results

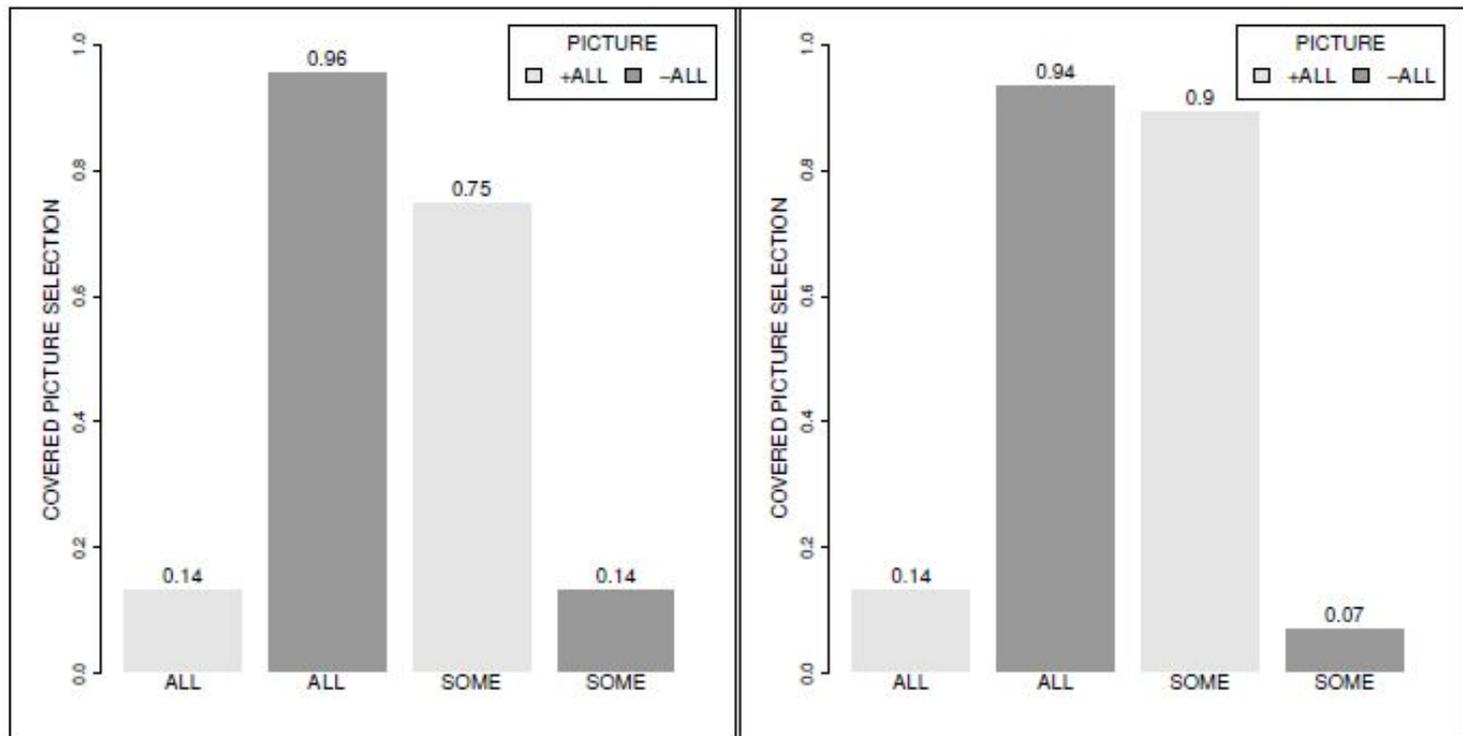


Figure 28: SCAL result German

Figure 29: SCAL result Russian

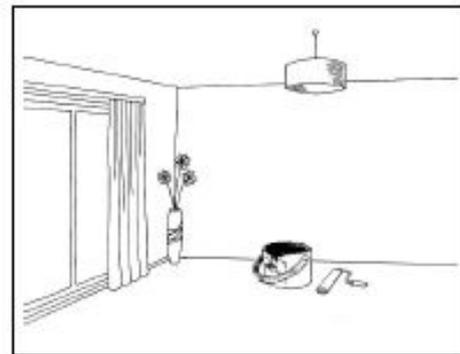
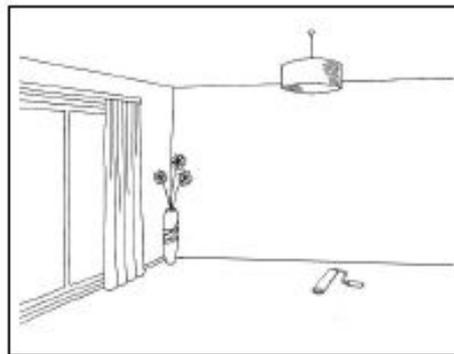
EXH: structure

- The experiment tested the participants' sensitivity to contradictions of exhaustivity implicatures and their dependency on factors similar to the ones manipulated in MAIN. The aim was to compare the size of the effect of brought about by pragmatic (as opposed to presuppositional) exhaustivity violations.
- The manipulated factors were: NUMBER (sg. vs. pl.), WORD ORDER (S PRED vs. PRED S), DEFINITENESS (def. vs. indef.), DETERMINACY (bare vs. determined.; manipulated only in Russian), PICTURE (-exhaustive vs. +exhaustive).
- An example from Russian:

(21) My xoteli pokrasit' stenu.

a. **(Kakoj-to) valik uze lezal na polu.**

b. **Na polu uze lezal (kakoj-to) valik.**



EXH: results

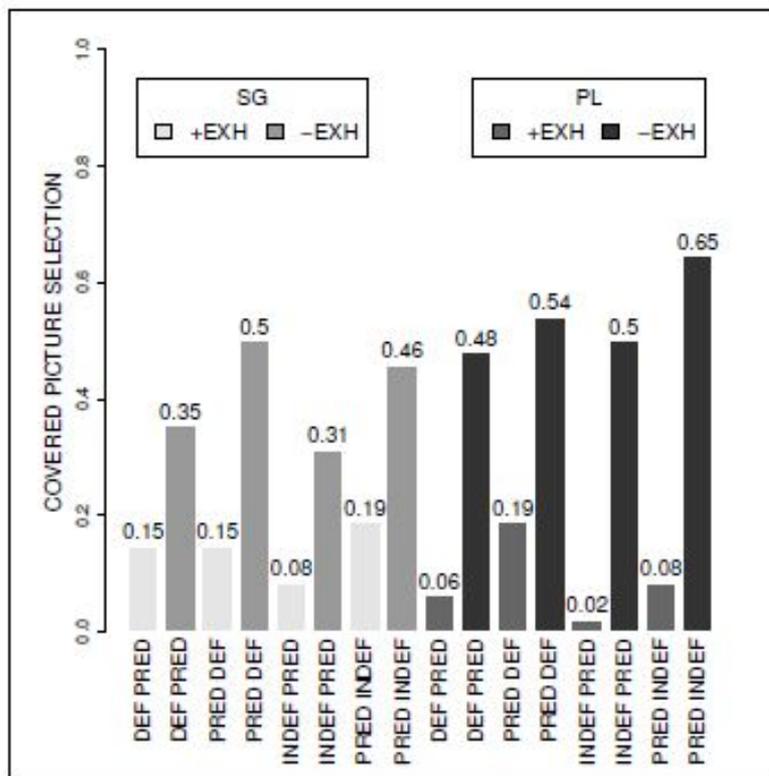


Figure 31: EXH result German

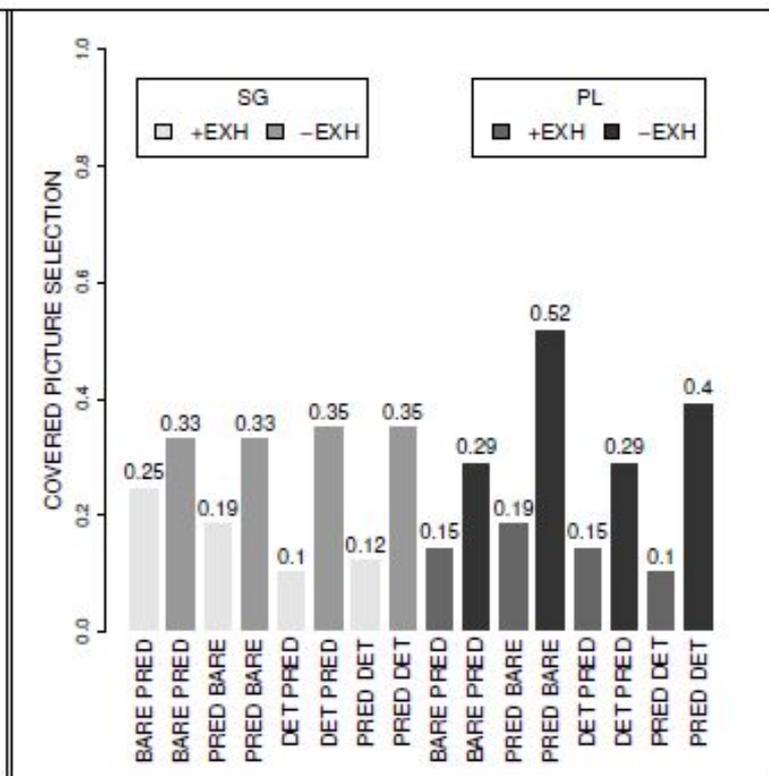


Figure 32: EXH result Russian

General discussion

The semantics of definite descriptions

Definite descriptions do exhibit consistent sensitivity to violations of the uniqueness/maximality inference — by hypothesis a presupposition,

- but relatively weak — only 42% of critical cases!

Filler experiments confirm this result as surprising:

- presupposition violations in case of ‘also’ and ‘both’ were recognized in >90% of cases;
- the same as assertion violations for ‘only’;
- similarly to implicature violations for ‘some’;

The effect of uniqueness/maximality violation is only comparable to the effect of pragmatic exhaustification violations (*i. e.* violations of the maxim of quantity)

The semantics of definite descriptions

This might be due to:

1. the design working differently than intended
2. uniqueness/maximality being implicatures rather than presuppositions
3. the discourse structure backgrounding the relevance of uniqueness/maximality inferences significantly
4. some definite NPs being construed as weak definites
5. grammatical nature of definiteness rendering its semantics less salient

The semantics of definite descriptions

1. the design working differently than intended

The covered box paradigm is also relevant for uncovering dispreferred interpretations:

- Coppock & Beaver (2015): definites can have both determinate and indeterminate readings
 - although, the latter under conditions different to that of the experiment
- the participants might have chosen the visible picture (as opposed to the expected covered choice), because it matched the dispreferred (indeterminate) interpretation

This isn't likely to be true, because the same isn't observed for 'some'.

The semantics of definite descriptions

2. uniqueness/maximality being implicatures rather than presuppositions

The comparable effect size in DEF and EXH might be due to both being implicatures:

- but the same isn't observed in SCAL (also concerned with implicatures)
- this might be the case, if uniqueness/maximality is conversational, and 'some, but not all' conventional (Chierchia 2006)

The semantics of definite descriptions

3. the discourse structure backgrounding the relevance of uniqueness/maximality inferences significantly

In MAIN (as opposed to other batches) the context is incomplete without the target sentence:

- it raises an implicit or explicit question

E. g. in ID 1 something happened at the butcher's → 'What happened?'

- 'a/the pig run away' (this answers the question)
- the question would be answered irrespective of how many pigs there are / ran away

The semantics of definite descriptions

3. the discourse structure backgrounding the relevance of uniqueness/maximality inferences significantly

E. g. in ID 1 something happened at the butcher's → 'What happened?'

- 'a/the pig run away' (this answers the question)
- the question would be answered irrespective of how many pigs there are / ran away

The latter fact might have been so important as to background uniqueness/maximality:

- it is surprising that a pragmatic factor of this kind would affect this inference to such an extent (esp. if it is a presupposition)

The semantics of definite descriptions

4. some definite NPs being construed as weak definites

Manfred Krifka (p. c.): these NPs might have been construed as weak definites.

- Weak definites: *listen to the radio, go to the grocery store*
- Weak definites are known for not needing to satisfy uniqueness (Aguilar-Guevara 2014)

This is plausible, although none of the items in MAIN were prototypical weak definites.

The semantics of definite descriptions

5. grammatical nature of definiteness rendering its semantics less salient

Ellen Brandner (p. c.): articles are also — and primarily — grammatical items, making NPs usable in a sentence and conveying grammatical information.

- The surprisingly weak results could suggest the need for a multi-factorial analysis, where the grammatical load of words reduces the salience of semantic inferences they convey.

The general result of DEF resonates with De Vegaugh-Geiss et al. (2019), who also found the uniqueness/maximality inference to be weaker than expected.

The semantics of bare NPs in articleless languages

The missing effect of topicality (see discussion of WO results) might be due to:

1. the covered box paradigm not working as intended
 - *i. e.* the dispreferred reading is chosen as suggested for DEF
 - this doesn't line up with results of SCAL
2. the design failing to manipulate topicality
 - maybe the discourse structure made topicality much less significant (“floor effect”)
 - but filler experiments results demonstrate high sensitivity to presuppositional and implicature phenomena, so the floor explanation is hard to swallow
3. the uniqueness/maximality presupposition not being a part of bare NP semantics in articleless languages
 - this is plausible, alternative definiteness notions might be relevant for bare NPs
 - *e. g.* all targets were identifiable

The semantics of bare NPs in articleless languages

The missing effect of topicality (see discussion of WO results) might be due to:

the null hypothesis (Heim 2011) holding:

- *i. e.* all bare NPs in articleless languages are indeterminate
- many issues remain to be explored w. r. t. this hypothesis
 - *e. g.* scope patterns
 - but see Borik (2016) and (Borik & Seres 2018), who contest these data

The semantics of bare NPs in articleless languages

The unexpected effect of NUMBER might be due to:

1. the fact that maximality is easier to satisfy than uniqueness

Maximality follows from existence unlike uniqueness:

- any non-empty set of **plural** entities automatically contains the maximal entity – an entity that contains all the others
- any non-empty set of **atomic** is not automatically a set containing exactly one entity

This works only if bare NPs in articleless languages presuppose existence,

- but why wouldn't this presupposition project across all sorts of scoping operators

The semantics of bare NPs in articleless languages

The unexpected effect of NUMBER might be due to:

2. bare plurals having maximizing meanings even in languages with articles
(Condoravdi 1992)

() In 1985 there was a ghost haunting the campus.
(The) Students were aware of the danger.

This might be carried over to articleless languages, however:

- this effect is very restricted (unlike what we see in Russian bare plurals)
- a similar effect is not observed in German bare plurals

Definiteness crosslinguistically

This experiment failed to find any correspondence between definite articles and definiteness correlates (number, word order, and prosody).

What other correlates might play a role?

- (aspect and case as two possibilities)

Which notions other than uniqueness/maximality could lie behind recurring “definiteness” intuitions in the literature on articleless languages?

- (familiarity and indentifiability are two possibilities)

**See references in the
original paper**