Production and comprehension of personal pronouns in German, Russian and Bulgarian child language

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Experimental investigation

- production + comprehension of personal pronouns (PERS)
- German, Russian, Bulgarian monolinguals
- 3- and 5-year-olds

Independent Variables

- syntactic role: SUBJECT vs. OBJECT
- animacy status: ANIMATE vs. INANIMATE referent

Central question

Do children use SYNTACTIC ROLE and ANIMACY STATUS as cues in production and comprehension of PERS?

Theoretical background

Givenness/Accessibility-based approaches to co/reference, e.g.:

- **Givón (1979, 1983, 1992, 1995, 2005)**
- **Ariel (1990, 2004, 2008)**
- **Gundel et al. (1993, 2007); Gundel & Johnson (2008)**

General Claim

Anaphora production/resolution is primarily guided by the mental accessibility of referents SALIENCY

BUT:

What is it that makes referents salient?

What determines the degree of mental accessibility?

Our Experiment: SYNTACTIC ROLE + ANIMACY STATUS

Method

- combined production + comprehension experiment

  production: kind of repetition
  comprehension: answer after question

Material

- short stories
- acted out with puppets by the experimenter

Subjects

	3-year-olds	5-year-olds
German	n= 27	n = 26
Bulgarian	n = 21	n = 31
Russian	n = 25	n = 25

Experimental design: 2x2x3

2x2 resolution criteria

animate vs. inanimate
subject vs. object

4 types of Antecedent Sentences

A) +anim S : +anim O ***the bear is kissing the dog***
B) -anim S : +anim O ***the ball is touching the fox***
C) -anim S : -anim O ***the car is pushing the bus***
D) +anim S : -anim O ***the tiger is driving the tractor***

abbrev.:
+S –S / +O –O

3 pronoun types 3 types of Anaphoric Sentences

PERS ***it/he laughs loudly / is blue ...***
DEM ***that/this one laughs loudly / is blue ...***
NULL ***__ laughs loudly / is blue ...***

Experimental stimuli: example

Exp 1 (narrator):	***Look, that's the bear and that's the ball.***
	The bear likes to play football.
	Now the ball is in front of the bear.
antecedent sentence:	***The bear is kicking the ball.***
anaphoric sentence:	***HE is white.*** *(altern.: THIS is white / Ø is white)*
Exp 2 (distracted puppet):	***Oh, what happened? I couldn't get it.***
Child "repetition":	***PRO is white.***
Exp 2 (distracted puppet):	***Who is white?***
Child comprehension:	***The bear / The ball.***

Focus of the actual analysis: A/Symmetry

Do children use the same pattern of saliency determining cues in production and comprehension of PERS?

Patterns of A/Symmetric use of SYNTACTIC ROLE + ANIMACY STATUS

Evidence for symmetric processing of PERS in production + comprehension is given if one of the following patterns occurs:

comprehension cue(s)	production of PERS over the 4 conditions
• S or O	no preference for any condition
• animacy	less/least frequent in C (only inanim antecedents)
• inanimacy	less/least frequent in A (only anim antecedents)
• anim S	more/most frequent in A+D (anim S)
• inanim S	more/most frequent in B+C (inanim S)
• anim O	more/most frequent in A+B (anim O)
• inanim O	more/most frequent in C+D (inanim O)

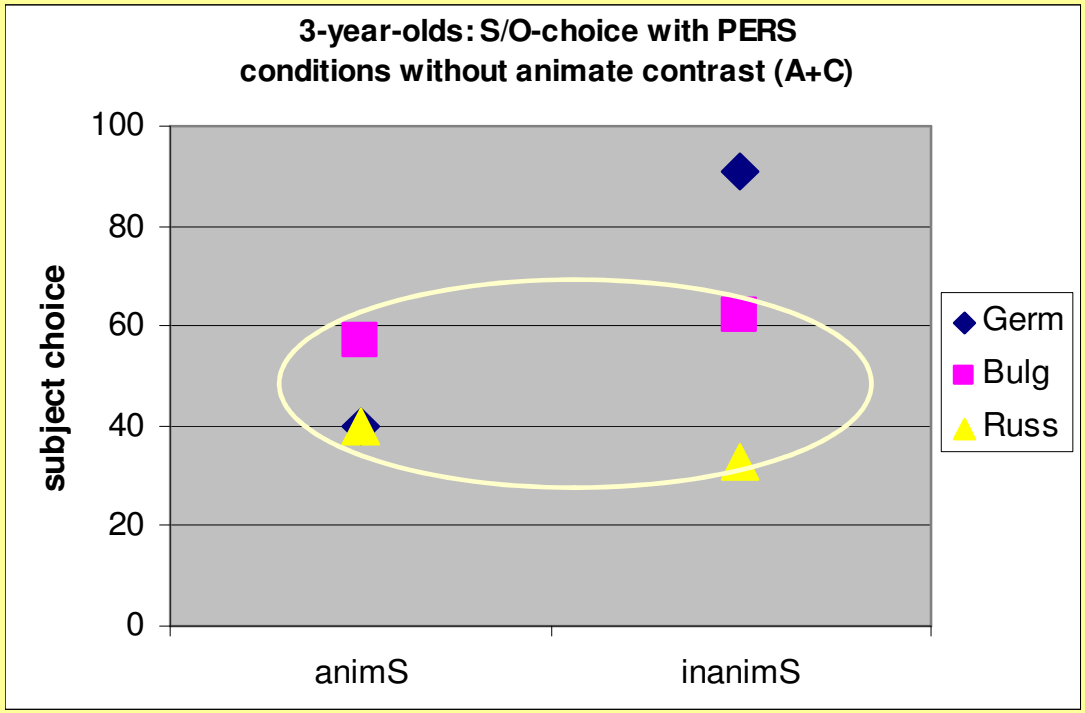
If none of these patterns occurs, there is evidence for asymmetric processing of PERS in production and comprehension.

Results: 3-year-olds - comprehension

Note: all analyses are related to PERS produced in the repetition task

SYNTACTIC ROLE as resolution cue?

conditions WITHOUT animacy contrast (A+C)

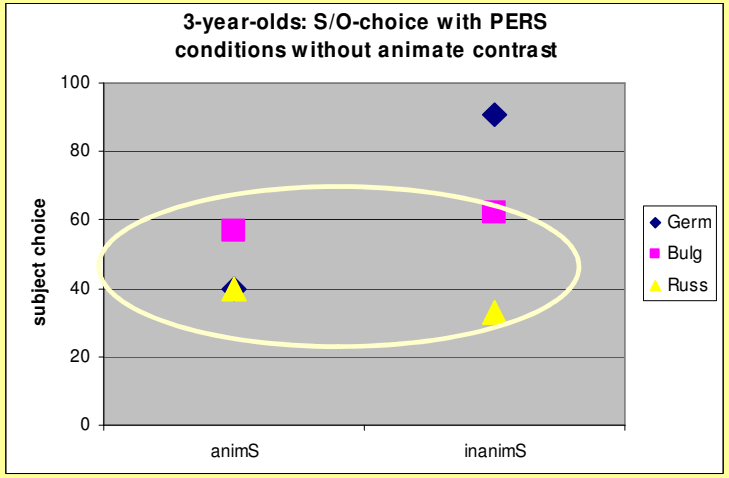


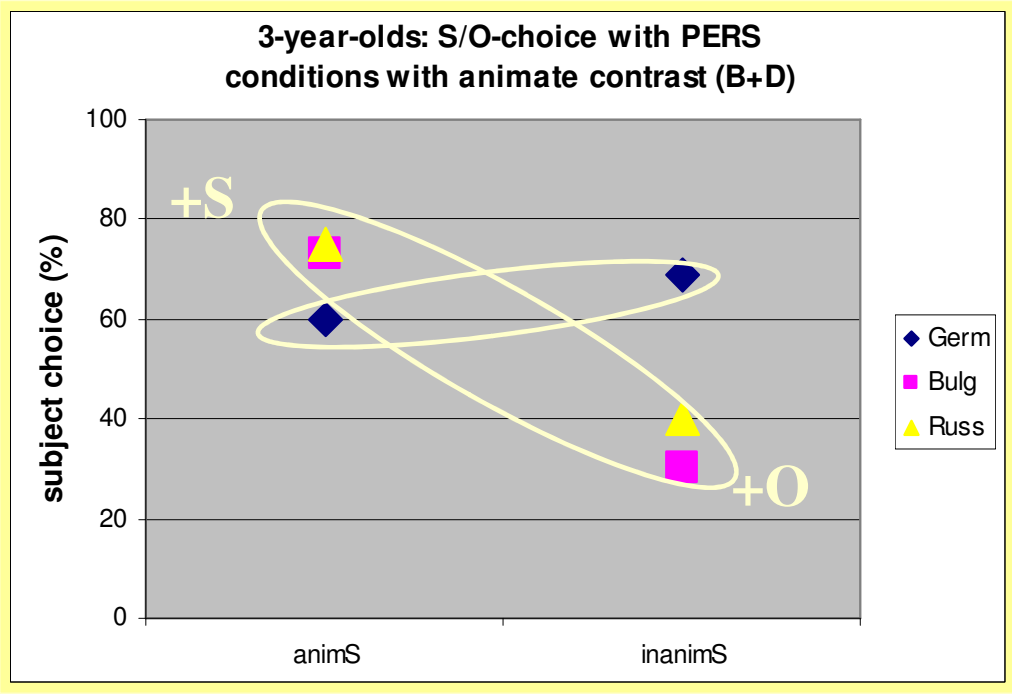
NO evidence!

Results: 3-year-olds - comprehension

SYNTACTIC ROLE or ANIMACY as resolution cue?

conditions WITH animacy contrast (B+D)





GERM: SUBJECT ROLE (tendency)

RSS+BLG: ANIMACY

Results: 3-year-olds

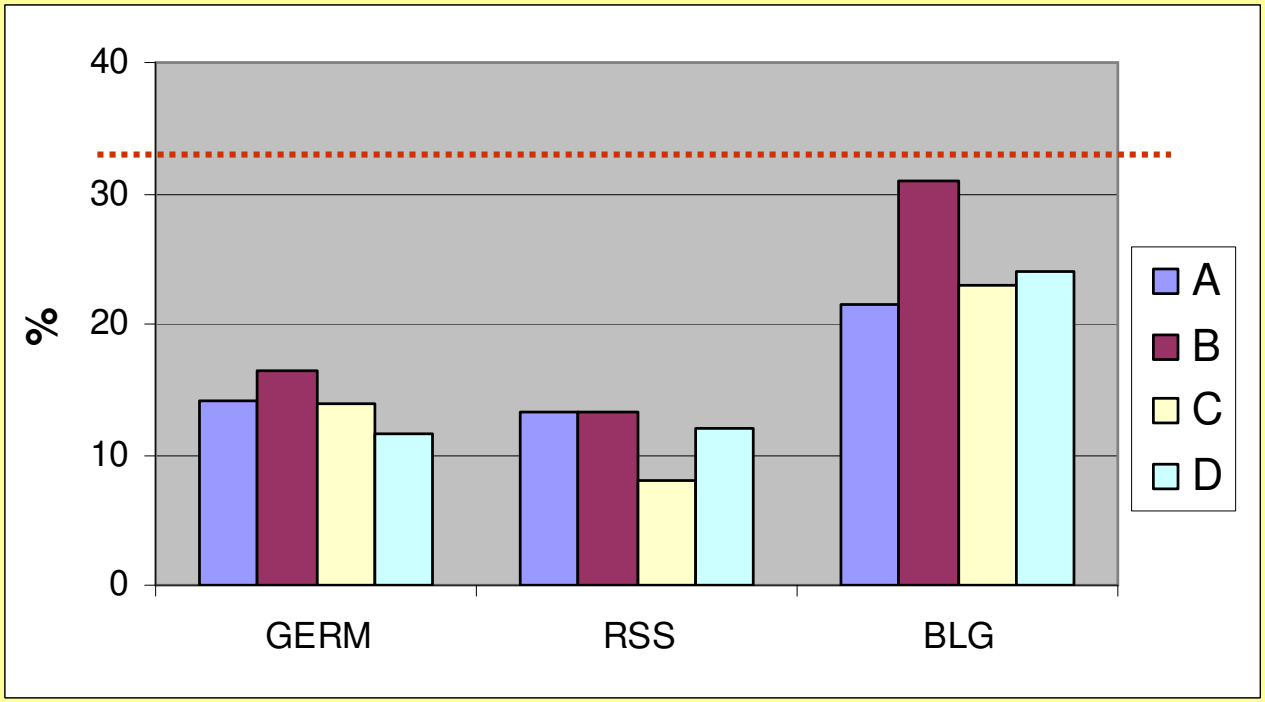
Symmetry-Hypotheses (cf. slide 7)

Evidence for symmetric processing with PERS if:

	comprehension cue	production
GERM:	**SUBJ. ROLE**	**no preference for any condition**
BLG/RSS:	**ANIMACY**	**less/least frequent in C** (only inanim antec.)

Results: 3-year-olds - production ("repetition")

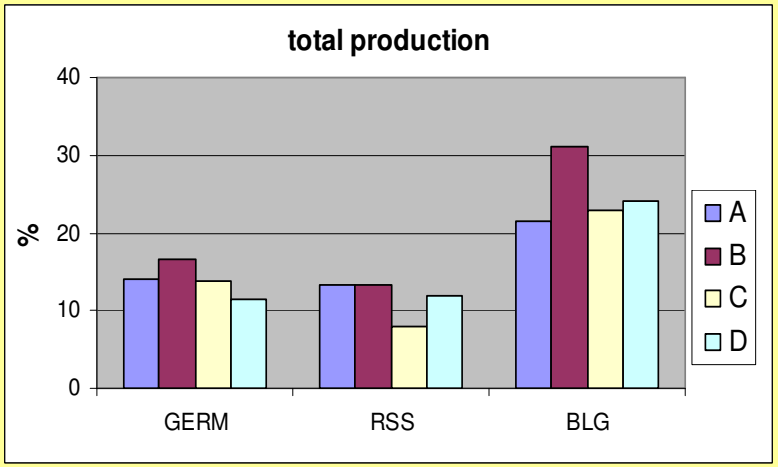
Overall production of PERS

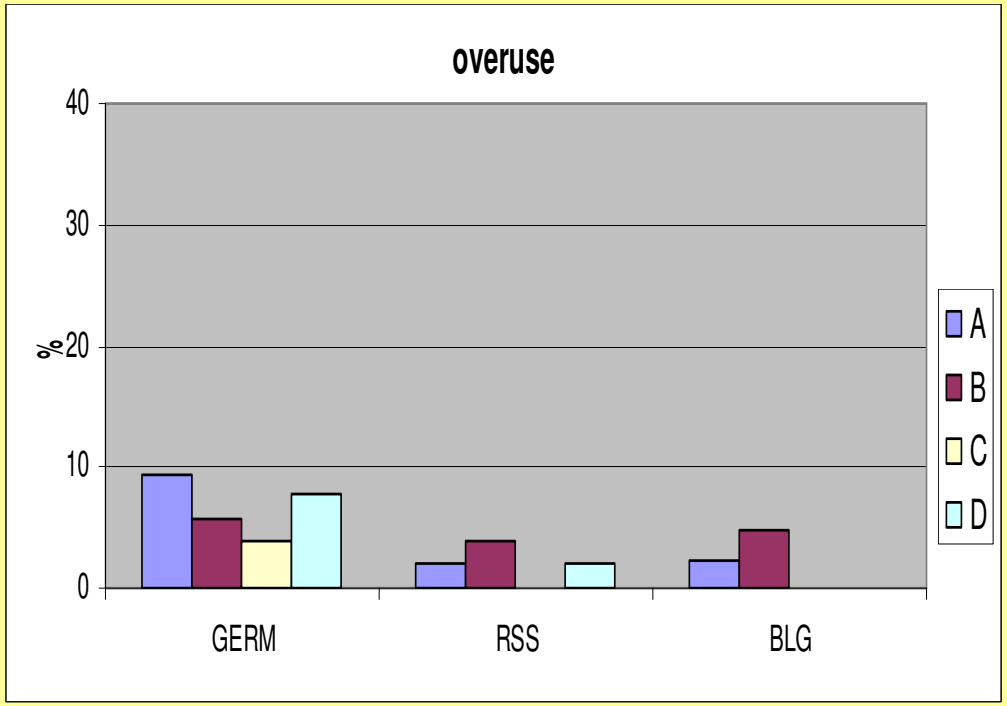


GERM: no preference for any condition
RUSS: least frequent in C
BULG: not least frequent in C but most frequent if animacy contrast (B+D)

Results: 3-year-olds - production ("repetition")

Overuse of PERS





GERM: no preference for any condition

RUSS: not in C (–S +O)

BULG: highest in B (–S +O), **but not in D** (+S –O)

Results: 3-year-olds - SUMMARY

A/Symmetric use of SYNTACTIC ROLE + ANIMACY STATUS?

	GERM	RUSS	BULG
compreh. cue(s)	**S** role	**Animacy**	**Animacy**

Results: 3-year-olds - SUMMARY

A/Symmetric use of SYNTACTIC ROLE + ANIMACY STATUS?

	GERM	RUSS	BULG
compreh. cue(s)	S role	Animacy	Animacy
production	no preference, S cue very likely		
USE OF CUES	SYMMETRIC		

Results: 3-year-olds - SUMMARY

A/Symmetric use of SYNTACTIC ROLE + ANIMACY STATUS?

	GERM	RUSS	BULG
compreh. cue(s)	S role	Animacy	Animacy
production	no preference, S cue very likely	not in C, Animacy	
USE OF CUES	SYMMETRIC	SYMMETRIC	

Results: 3-year-olds - SUMMARY

A/Symmetric use of SYNTACTIC ROLE + ANIMACY STATUS?

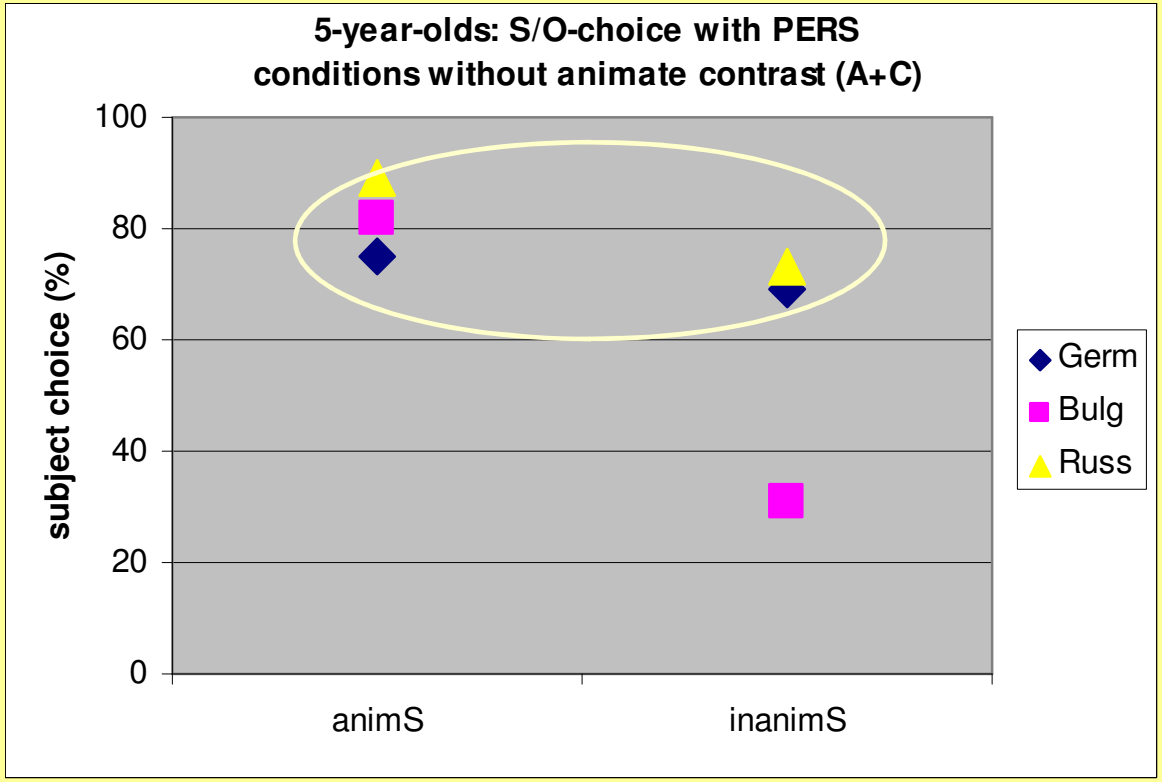
	GERM	RUSS	BULG
compreh. cue(s)	S role	Animacy	Animacy
production	no preference, S cue very likely	not in C, Animacy	most freq. B, ???
USE OF CUES	SYMMETRIC	SYMMETRIC	???

Results: 5-year-olds - comprehension

Recall: base of all analyses = PERS produced in the repetition task

SYNTACTIC ROLE as resolution cue?

conditions WITHOUT animacy contrast (A+C)



GERM + RUSS:

YES – subject role!

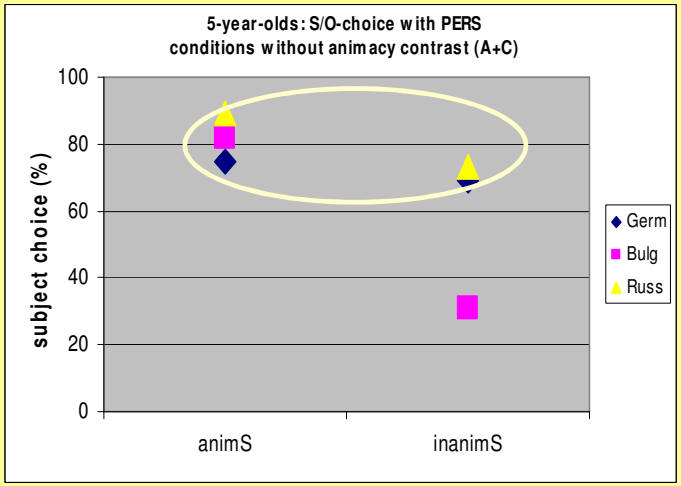
BULG:

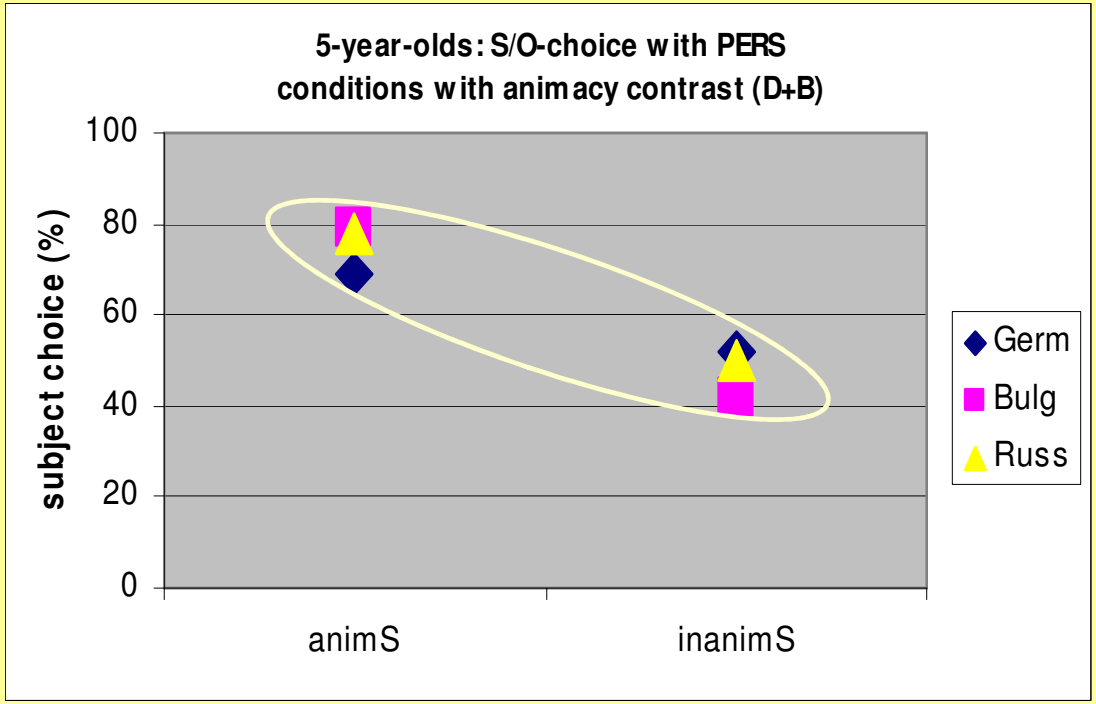
NO - but animacy?

Results: 5-year-olds - comprehension

SYNTACTIC ROLE or ANIMACY STATUS as resolution cue?

conditions WITH animacy contrast (D+B)





GER+RSS: SUBJECT role dominant
BUT in addition ANIMACY

BULG: interaction SUBJECT + ANIMACY +S

Results: 5-year-olds

Symmetry-Hypotheses

Evidence for symmetric processing with PERS if:

	GERM/RUSS			BULG
compreh. cue(s)	**S**	and	**ANIMACY**	**+S**

Results: 5-year-olds

Symmetry-Hypotheses

Evidence for symmetric processing with PERS if:

	GERM/RUSS		BULG
compreh. cue(s)	**S** and **ANIMACY**		**+S**
↓			
production	**no preference for any condition**		

Results: 5-year-olds

Symmetry-Hypotheses

Evidence for symmetric processing with PERS if:

	GERM/RUSS			BULG
compreh. cue(s)	**S**	and	**ANIMACY**	**+S**
	↓		↓	
production	**no preference**		**least frequent**	
	for any condition		**in C**	

Results: 5-year-olds

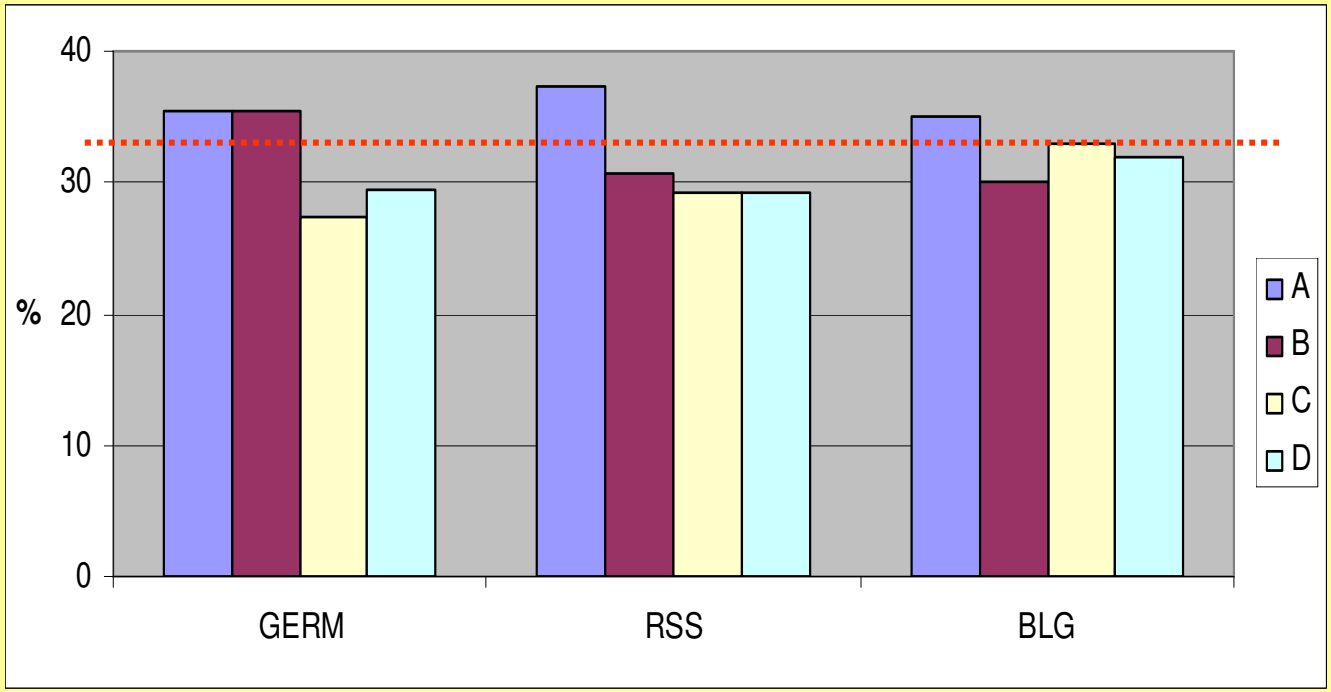
Symmetry-Hypotheses

Evidence for symmetric processing with PERS if:

	GERM/RUSS		BULG
compreh. cue(s)	**S** and **ANIMACY**		**+S**
	↓	↓	↓
production	**no preference**	**least frequent**	**most frequent**
	for any condition in C	**in +S-conditions A+D**	

Results: 5-year-olds - production ("repetition")

Overall production of PERS

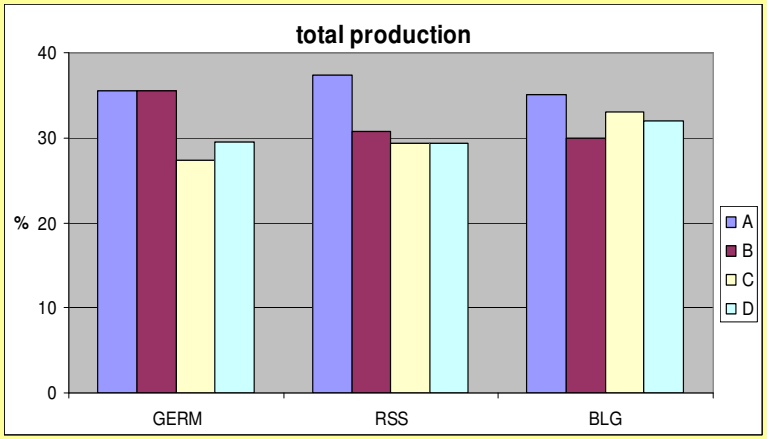


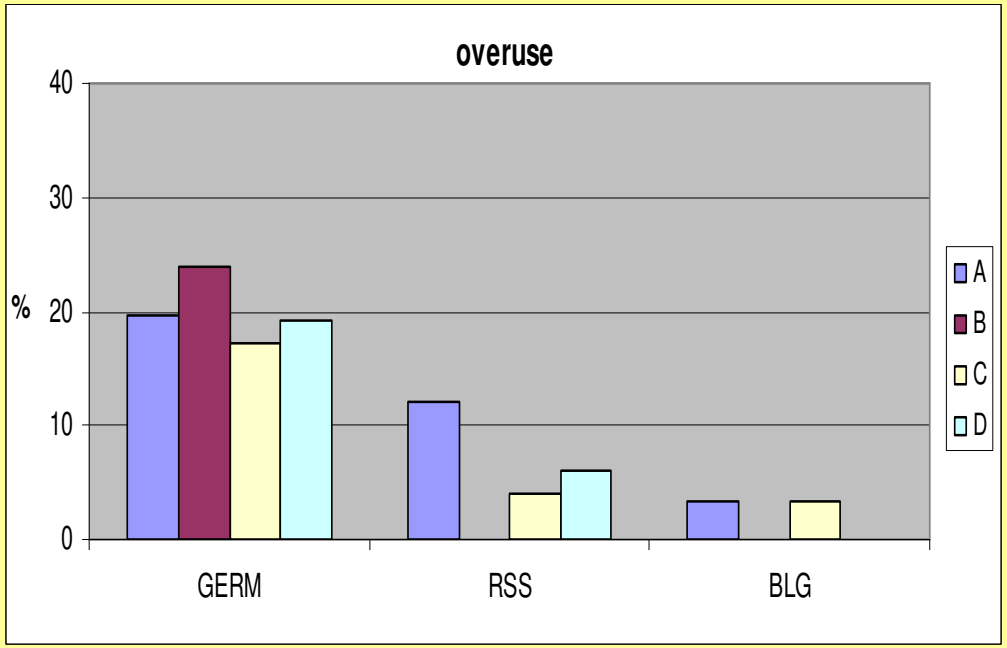
all 3 lang.: PERS slightly more frequent in A+D (+S) than in B+C (–S)
most frequent in A (+S +O) Animacy?

GER+RSS: least/less frequent in C (–S –O)

Results: 5-year-olds - production ("repetition")

Overuse of PERS





GER: most frequent in +O conditions (A+B)
least frequent in C
RSS: most frequent in +S conditions (A+D)

BLG: most frequ. if no animacy contrast (A+C)

all 3 languages: high(est) in A (+S +O) ANIMACY?

Results: 5-year-olds - SUMMARY

	GERM	RUSS	BULG
compreh. cue(s)	S + ANIM	S + ANIM	+S
production cue(s)	+O	+S	???

USE of CUES

Results: 5-year-olds - SUMMARY

	GERM	RUSS	BULG
compreh. cue(s)	S + ANIM	S + ANIM	+S
production cue(s)	+O	+S	???

USE of CUES

SYMMETRIC
ANIMACY
ASYMMETRIC
SYNT. ROLE

Results: 5-year-olds - SUMMARY

	GERM	RUSS	BULG
compreh. cue(s)	S + ANIM	S + ANIM	+S
production cue(s)	+O	+S	???
USE of CUES	SYMMETRIC ANIMACY ASYMMETRIC SYNT. ROLE	SYMMETRIC	

Results: 5-year-olds - SUMMARY

	GERM	RUSS	BULG
compreh. cue(s)	S + ANIM	S + ANIM	+S
production cue(s)	+O	+S	???
USE of CUES	SYMMETRIC ANIMACY ASYMMETRIC SYNT. ROLE	SYMMETRIC	???

Summary

1. SYNTACTIC ROLE and ANIMACY STATUS

= Salience determining cues in the early acquisition phase

- **language-specific cue patterns from early on**
- **increasing complexity/interaction of cues over age**

2. SYMMETRIC > ASYMMETRIC processing

Symmetric processing of PERS in production and comprehension seems to be more frequent than asymmetric processing

- **Asymmetric processing: increasing complexity of cues**
  interaction with other cues?

Resulting questions and conclusions

Empirical Questions

- **Is symmetric processing given with other types of anaphora too?**
- **Is symmetric processing weakend with increasing complexity of salience determining cues, i.e. with age?**
- **Do adults process salience determining cues a/symmtrical?**

Methodological Questions

- **accessible cues carefully enough controlled in former experiments?**
- **cognitive load of the experimental methods?**

CONCLUSION

- **SYMMETRIC processing or better comprehension than production skills NULLHYPOTHESIS**
- **ASYMMETRY has to be profen by asymmetric processing of concrete linguistic or extra-linguistic cues**

Current theoretical approaches: resolution cues

different sets and rankings of resolution cues

Classical Centering:	**subject > parallelism >** semant. infer.
Functional Centering:	**old inform.** > semantic infer. > **new inform. > parallelism**
Topic-Focus-Articul.:	semant. infer. > **parallelism > focus (new) > topic (old)**
Integrated Model:	**synt. parallelism ≥ topic ≥ semant. parallel. ≥ subject**
Pragmatic Accounts:	**topic > subject > object**

max. salient A. **min. salient A.**

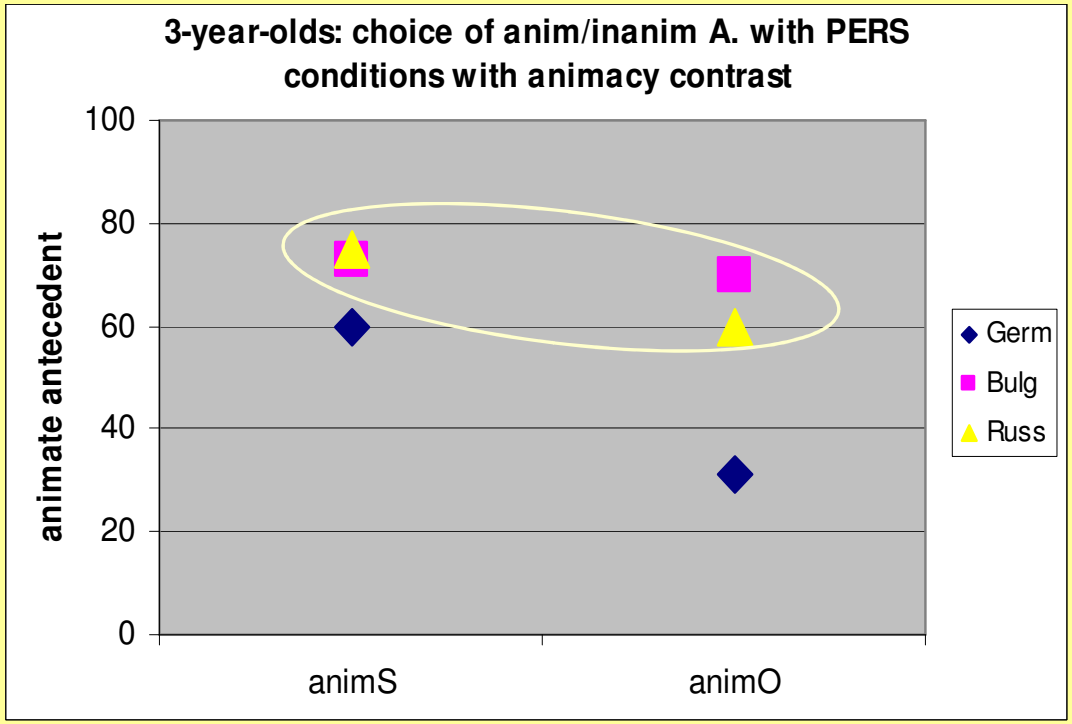
Cues assumed to be most important

- **syntactic role**
- **topic-focus**
- **information status (old/new)**

Results: 3-year-olds - comprehension

2. ANIMACY STATUS as resolution cue?

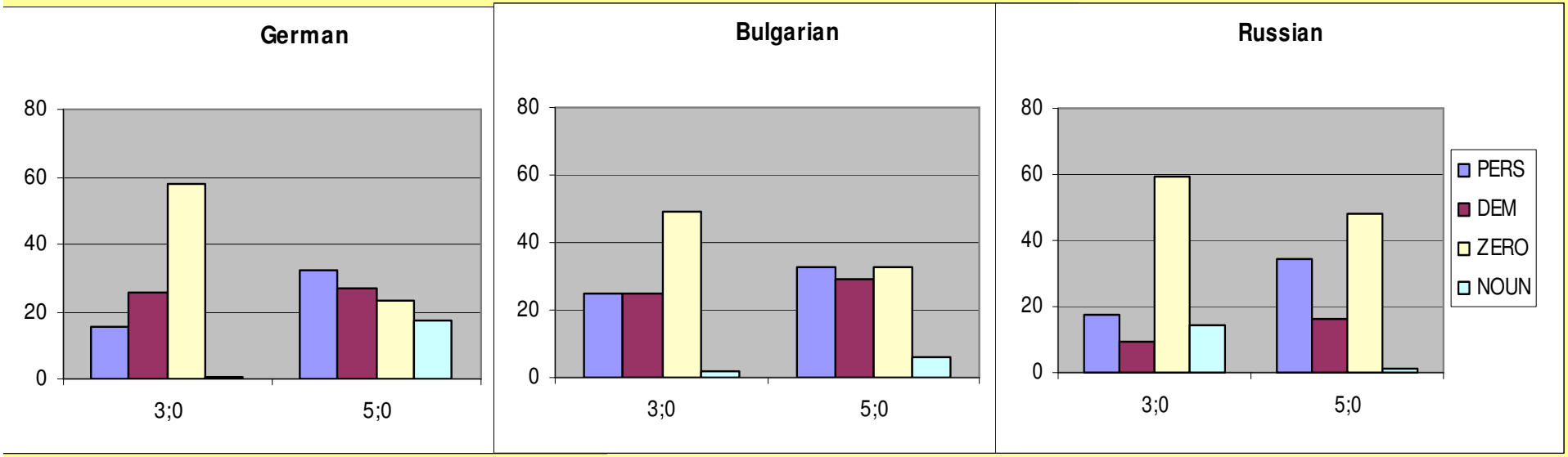
conditions WITH animacy contrast (B+D)



RSS+BLG: ANIMACY

GER: SBJ ROLE

Overall pronoun production



Our Investigation in Acquisition

- **Which salience determining cues are relevant in the acquisition process?**
- **Is the cue pattern changing over age?**
- **To what extent is it determined by language-specific properties?**