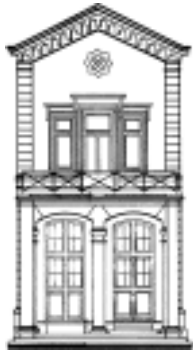


# The use of experimental methods in linguistic research: advantages, problems and possible pitfalls



Barbara Mertins  
(form. Schmiedtová)

Institut für Deutsch als Fremdsprachenphilologie  
Ruprecht-Karls-Universität Heidelberg

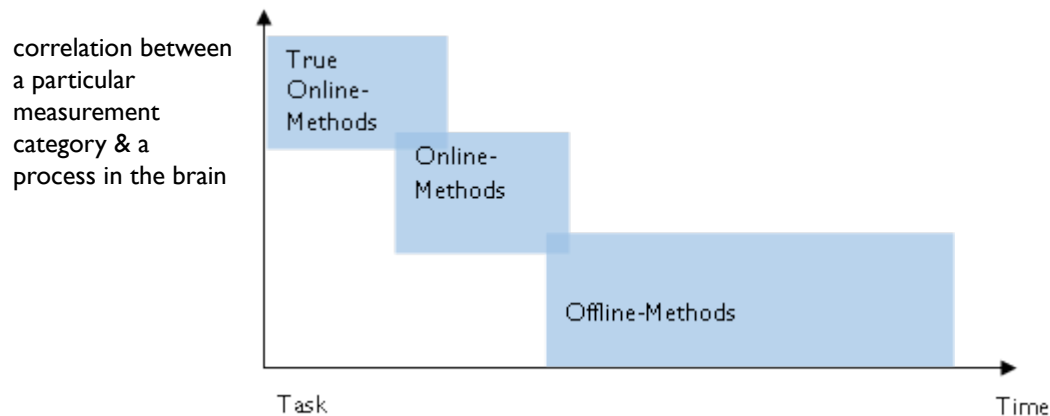


# Outline

1. Classification of psycholinguistic methods
  - some pros and cons
2. Methods used in own language production research
3. Examples from own research: research questions and the use of different methods
  - advantages, disadvantages, possible problems and challenges
4. Closing remarks
  - data coding/analysis, intercoder agreement, data presentation; the use of statistics

# I. Methods: a classification

- **Offline** (e.g., pen-and-pencil questionnaire, naming)
  - no time pressure, conscious decision making
- **Online** (e.g., RT experiments, ET)
  - a mediated access to the process; some automatized / unconscious processes can be investigated
- **True Online** (e.g., EEG, fMRI)
  - an immediate access to the relevant process; unconscious processes



# I. Methods - pros/cons

- **Offline Methods**

(-) no or little control over the data collection (especially when collected via a web based questionnaire);

(+) a large amount of data can be collected at once; easy logistics and almost no costs; no time pressure → competence in the foreground

# I. Methods - pros/cons

- **Online Methods**

(-) a slowdown by hand / eye movements; a relatively high logistic effort (one person per recording session) → limited sample size

(+) better conditions for testing unconscious, more automatized mental processes → performance in the foreground; control over the experimental course

# I. Methods - pros/cons

- True Online Methods

(-) a huge logistic and financial effort; usually only limited number of subjects possible; strong dependency on “hidden” statistics; only a particular experimental design possible (e.g., restriction on free language production)

(+) “true” performance in the foreground; access to very automatized and unconscious mental and **neuronal** processes

## II. Language production methods used in own research (oral/written)

- **Elicitation** → recording of linguistic data (offline or online method – depending on time constraints)
- **Memory tasks** → collection of non-linguistic data (in my research an offline method)
- **Eye-Tracking** → access to visual attention data (online method)
- **Speech Onset Times** → access to data from planning processes (online method)
- **Preference Judgment task** → offline method
- **Grammatical Judgment task** → offline method
  - access to linguistic competence → both methods good for testing a particular linguistic phenomena in larger populations

# II. Language Production

## Challenges

- Logistical / Technical efforts → high
  - at least 20 “good” subjects per experiment / research question (otherwise statistical analysis in danger)
  - comparability of exp. settings in individual recordings
- Creation of a good stimulus set
  - i.e. “spontaneous” language production in experimental setting a real challenge  
(see E. Schegloffs criticisms of experimental research)
- Audio data transcription → very time demanding



# II. Elicitation

Elicitation is the act of obtaining language data from another person

– e.g. , “semi-spontaneous” language production data

## **Why elicitation?**

- particular structure (e.g., case)
- rare phenomenon (e.g., simultaneity marking)
- hypothesis testing (e.g., determiners before tense marking)

# II. Elicitation – cont.

- **How to elicit?**
  - context restrictions
  - stimulus manipulation
  - minimal pairs
- **Stimulus types:**
  - specific pictures
  - picture books (e.g., The Frog Story)
  - audio; written text (e.g., association tasks)
  - **video clips**

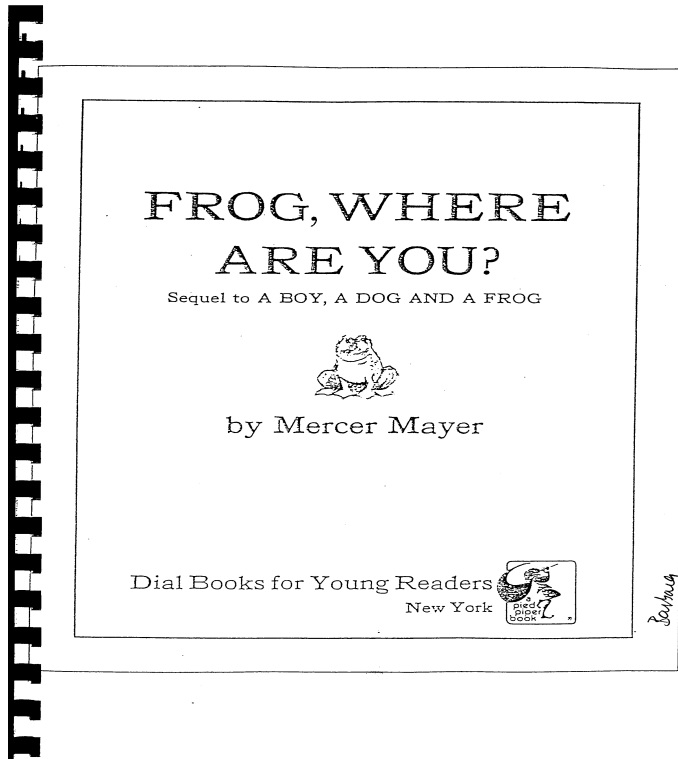
# II. Elicitation: examples

- LI language production: temporal simultaneity  
Exp: *a goat drinking vs. a drinking goat*



# II. Elicitation: examples

- Frog story – used in different contexts with different populations (e.g., L1, L2, impaired)



# III. Own research

- **Studies**

Schmiedtová & Sahonenko, 2008

Schmiedtová, 2011

Schmiedtová, 2011a

v. Stutterheim, et al., 2012

Schmiedtová, 2013

Schmiedtová, 2012, 2013a

# III. Own research

- **Studies**

- Schmiedtová & Sahonenko, 2008**

- Schmiedtová, 2011

- Schmiedtová, 2011a

- v. Stutterheim, et al., 2012

- Schmiedtová, 2013

- Schmiedtová, 2012, 2013a

# ELICITATION

## **STUDY 01, Schmiedtová & Sahonenko, 2008**

Die Rolle des grammatischen Aspekts in der Ereignis-Enkodierung: Ein Vergleich zwischen tschechischen und russischen Lernern des Deutschen  
In P. Gommae & M. Walter (eds.). *Fortgeschrittene Lernervarietäten: Korpuslinguistik und Zweitspracherwerbforschung*. Tübingen: Max-Niemeyer-Verlag, 45-71.

# General Background

- Previous work on LI comparisons of Germanic, Romance, and Semitic
  - grammaticalization of **aspect** is one of the factors which determine how information is selected and structured in dynamic contexts



# Underlying L2-related questions

1. Can advanced adult learners acquire the full range of linguistic knowledge, which grammaticalized means entail for the temporal domain?
2. To what degree can advanced and very advance L2+ speakers **learn to reorganize conceptual knowledge** in the direction of the target language?

# Investigated languages

## Czech & Russian (L1)

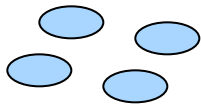
have a rich tempus-aspect system

1. aspect expression obligatory
2. aspect grammaticalized (Perf vs. Imperf.)

## German (L1)

has no aspectual system, but expresses tense

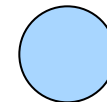
1. no grammatical aspect
2. aspectual relations can be expressed by other means



many categories



Is this “easier”?



few categories

# Stimuli & Method

- Stimulus material
  - 40 short video clips
    - randomized, 5 sec blanks
- Elicitation
  - On-line condition: *Start to speak as soon as you know what is happening in the clip*
  - Question in present tense  
*Was passiert? Co se děje? Chto proisходит?*

# Subjects

- All informants
  - adults (university students)
  - age: between 20 and 30; Ø age: 23.5
- Native speakers
  - 30 informants in each group (Czech, German, Russian)
- Learners
  - 15 informants in each group (Czech and Russian L2 speakers of German – very advanced/near native)

# Level of proficiency

## Advanced learners

1. excellent language knowledge
2. active use of German in everyday life
3. an early onset of acquisition
4. highly tutored acquisition
5. length of stay in Germany

A problematic issue: self assessment as the only measure of language proficiency

# Domains of analysis

1. The use of **ASPECT** (in L1 CZE/RUS)
  - in events with resultative state
2. The use of **TENSE** (in L1s and L2s)
  - in all scenes, except fillers
  - Past = preterit + perfect + pluperfect
3. The marking of **ENDPOINTS**  
(in L1s and L2s)

# Example 01: critical item



**Clip: posting a letter**  
**Type: event with resultative state; N= 10**

# Example 02: filler



**Clip: table tennis, activity**  
**Type: filler; N=10**



# I. The use of Aspect

	CZECH	RUSSIAN
<b>Simplex form of type I</b>	Used frequently anywhere	Used mainly for low level of detail
<b>Secondary Imperfective</b>	Used rarely	<b>Used whenever it's possible</b>
<b>Perfective</b>	<b>Frequent</b>	Only in specific scenes
<b>Perfective &amp; present TENSE</b>	Also "here-and-now" reading	Never "here-and-now" reading


**Czech:  $\chi^2(2)=13.4, p=0.001$ ; Russian:  $\chi^2(2)=11.4, p=0.003$** <sup>25</sup>

## 2. The use of Tense

	Switch to PAST	PRESENT
L1 German	3%	97%
L1 Czech	60%	40%
L1 Russian	43%	57%
L2 GER_CZ	41%	59%
L2 GER_RU	27%	73%

**German:**  $\chi^2(1)=26,13, p=0.000$ ); **Czech:**  $\chi^2(1)=0,273, p=n.s.$ ;  
**Russian:**  $\chi^2(1)=0,465, p=n.s.$ ); **L2-speakers: CZE:**  $\chi^2(1)=0.6, p=n.s.$ ;  
**RUS**  $\chi^2(1)=3.267, p=0.071$  (TREND)

## 2. Summary – The use of Tense

- German native speakers choose the present tense form as the main tense form (almost no switching)
- Czech and Russian native speakers have no preference for one particular tense form
- L2-speakers (Czech and Russian) keep their L1-pattern also in the L2 (despite their advancedness)
  - Tense/Aspect switch used for marking background/foreground structures by near native L2 German speakers; **aspect transfer in form of different tense forms** → cf. Schmiedtová & Sahonenko, 2012
    - **Offline-Elicitation** of longer text with the Quest movie 

# Study 01 - Conclusions

1. “Slavic aspect” ≠ Russian aspect;  
Russian very different from Czech → focus on aspect use in language production
2. Tense Use → L2-learners seem to stick to the pattern from their L1 (*transfer phenomena*)
3. **Methodologically**: elicitation a good tool;  
BUT: more subjects necessary; more specific stimuli required; more fillers

# III. Own research- Study 02

- **Studies**

Schmiedtová & Sahonenko, 2008

Schmiedtová, 2011

Schmiedtová, 2011a

**v. Stutterheim, et al., 2012**

Schmiedtová, 2013

Schmiedtová, 2012, 2013a

# **ELICITATION, MEMORY, EYE-TRACKING**

## **STUDY 02, v. Stutterheim, Andermann, Carroll, Flecken, Schmiedtová, 2012**

How grammaticized concepts shape event conceptualization in language production: Insights from linguistic analysis, eye tracking data and memory performance In *Linguistics*, 4, 833-867.

# Research question

- The relation between the availability/degree of grammaticalization of the imperfective / progressive **aspect** in a given language system and the encoding of endpoints in goal-oriented locomotion
- Theoretical Framework: “*thinking for speaking hypothesis*”
- **Analyses**
  - linguistic
  - eye-tracking
  - memory data

# Recordings in the last three years

<b>Language</b>	<b>Number of Subjects</b>
Modern Arabic	100
English	120
German	100
Spanish	120
Dutch	100
Russian	100
Czech	110

Norwegian / Polish / Slovak



# Stimuli & Method

- **Stimulus material**

- Verbalizations of short scenes of everyday situations
- 60 short video clips, 6 sec long
- 10 critical items, 10 control items, 40 fillers
- Randomized, 8 sec blanks

- **Elicitation**

- On-line condition  
*You can start to speak as soon as you recognize what is happening in the clip?*
- Question in present tense  
***What is happening? Was passiert? Co se deje? Chto proischodit?***
- The same instruction across all languages



# Types of stimulus items

1. Endpoint reached (+END)
  - 10 items: **control condition**
2. Endpoint not reached (-END)
  - 10 items: **critical condition**
  - Both control/critical items controlled for additional factors (e.g., length, left/right, intercultural transferability)
3. Fillers
  - 40 items: states, homogenous activities

# Example: Filler



# Example: (+END)



# Example: (-END)



# Encoding of Endpoints

## - ENDPOINT

## + ENDPOINT

### English

*two women are walking  
down the road*

*two women are walking  
**towards a house***

### German

*zwei Frauen laufen  
auf einem Feldweg*

*zwei Frauen laufen  
**zu einem Haus***

### Czech

*dvě ženy jdou po cestě*

*dvě ženy jdou po cestě  
**ke stavení***

### Russian

*dve ženščiny idut po doroge*

*dve ženščiny  
idut po doroge **k domu***

### Dutch

*twee vrouwen lopen op straat*

*twee vrouwen lopen  
**naar een huis***

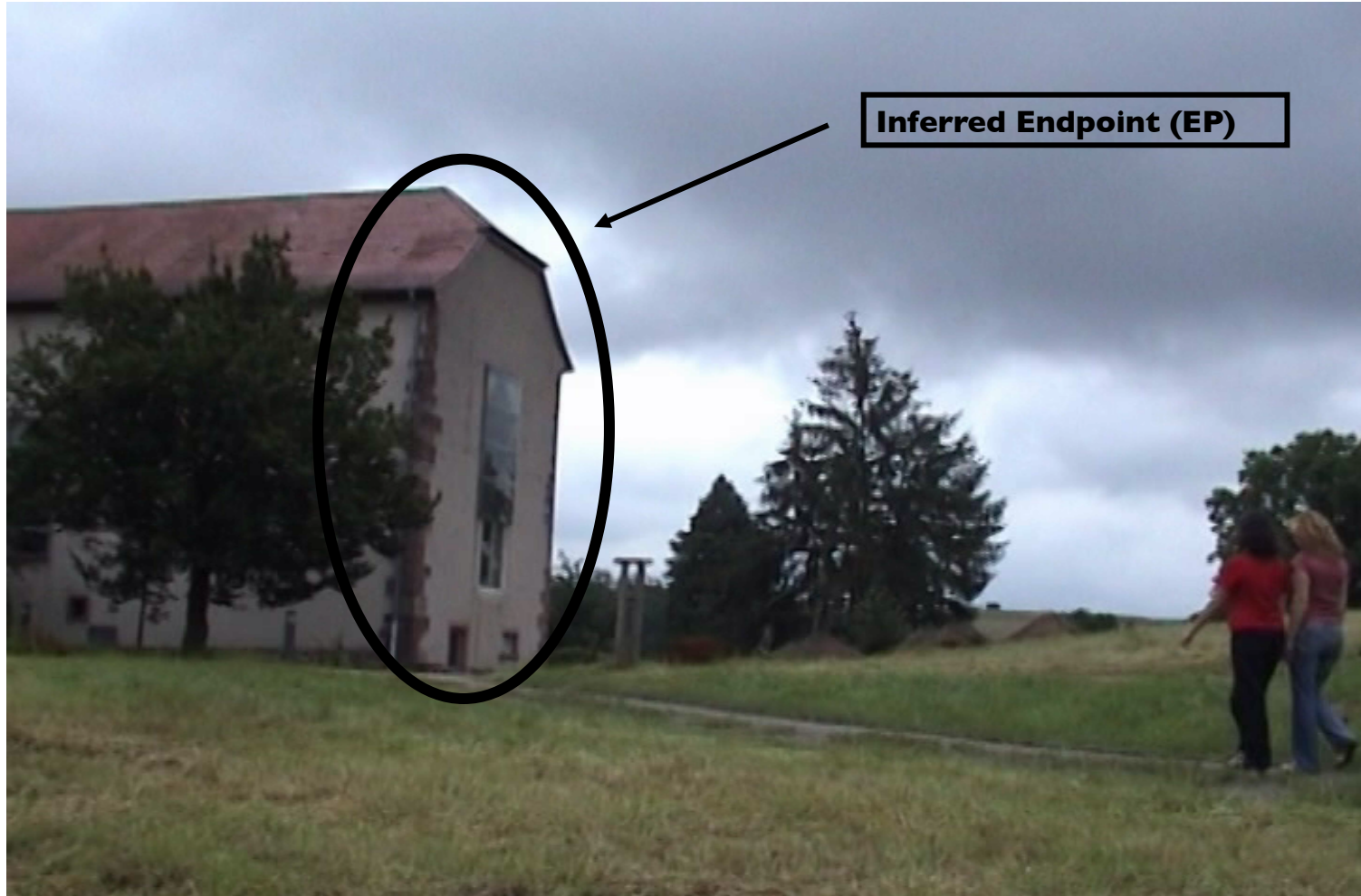
### MSA

*rāhibatāni tamšiyāni fi š-šāriʿi*

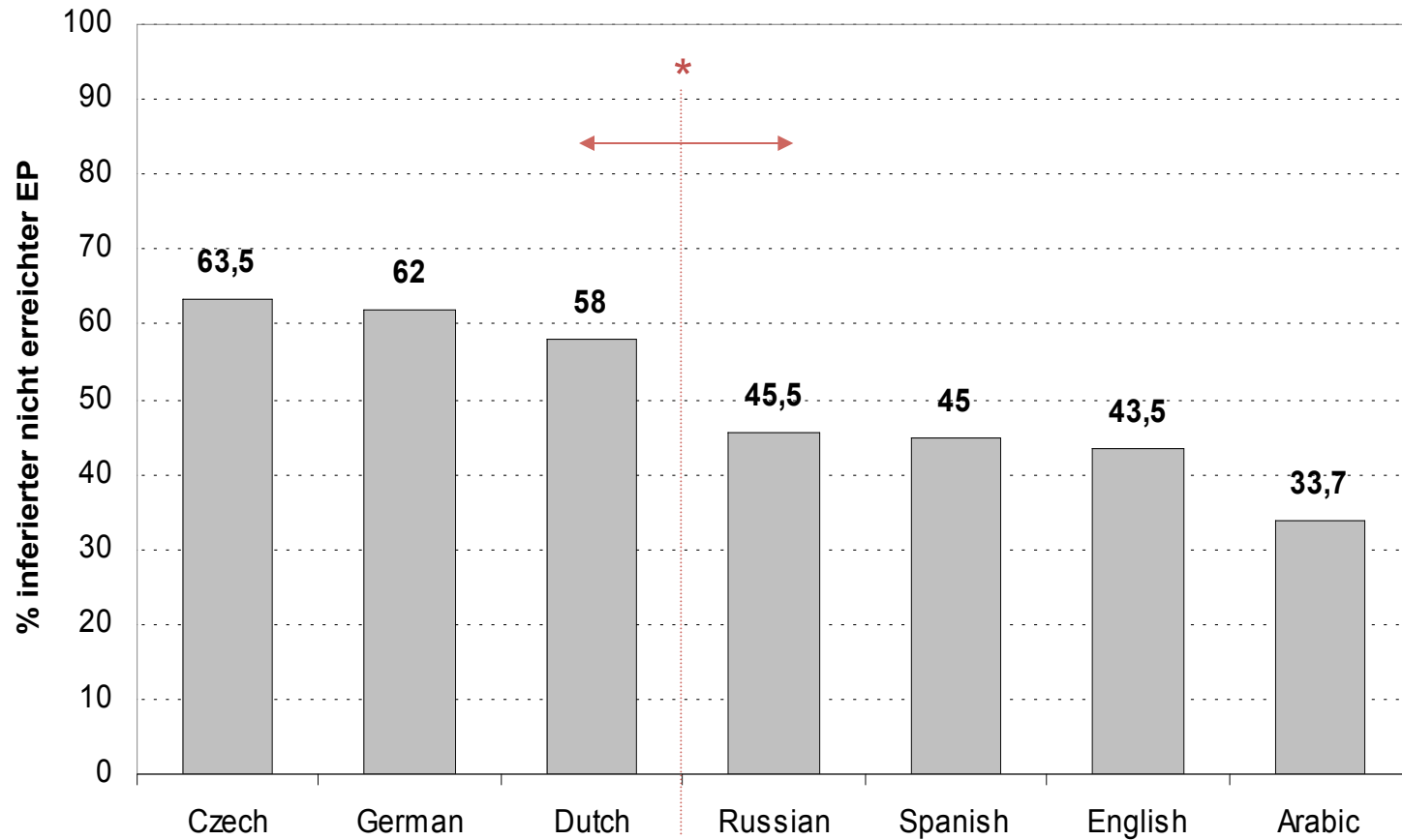
*rāhibatāni tattaġihāni  
**ilā l-kanīsati***



# Encoding of Endpoints (not reached)



# Linguistic Encoding



critical items  $\chi^2(6) = 32.87; p < .05$   
control items  $\chi^2(6) = 7.91; ns$

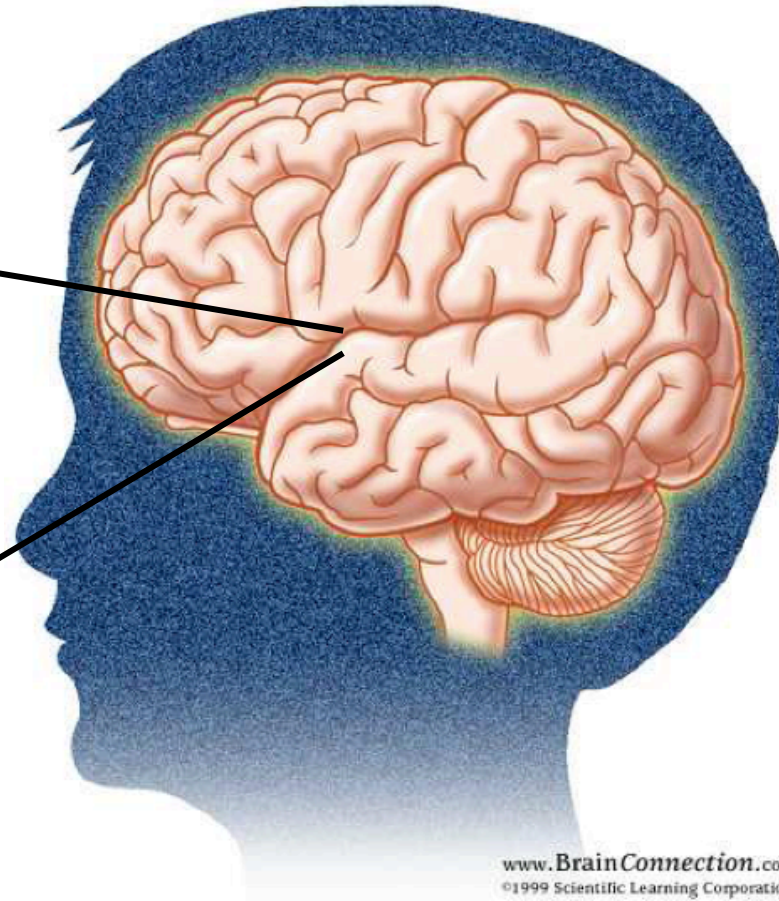
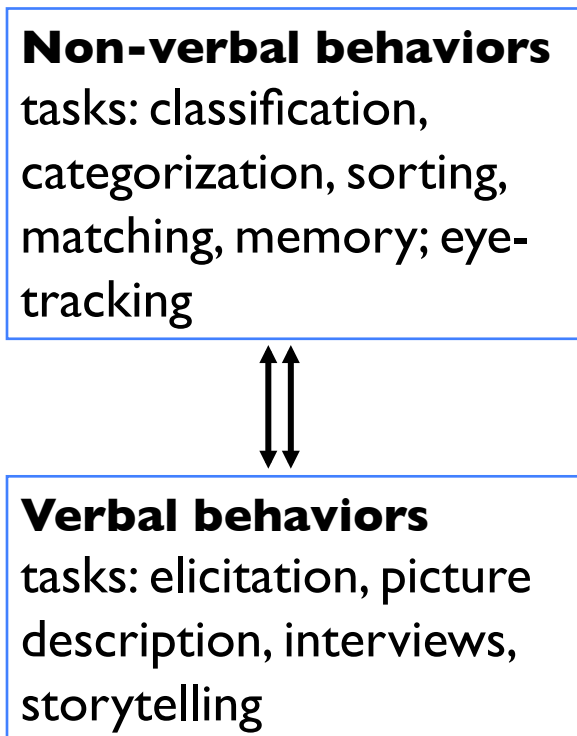
$p < .05$



# **Eye-Tracking & Memory Data**

- for testing the effect of language on cognition

# What counts as an effect of language on thought?



# Eye-tracking

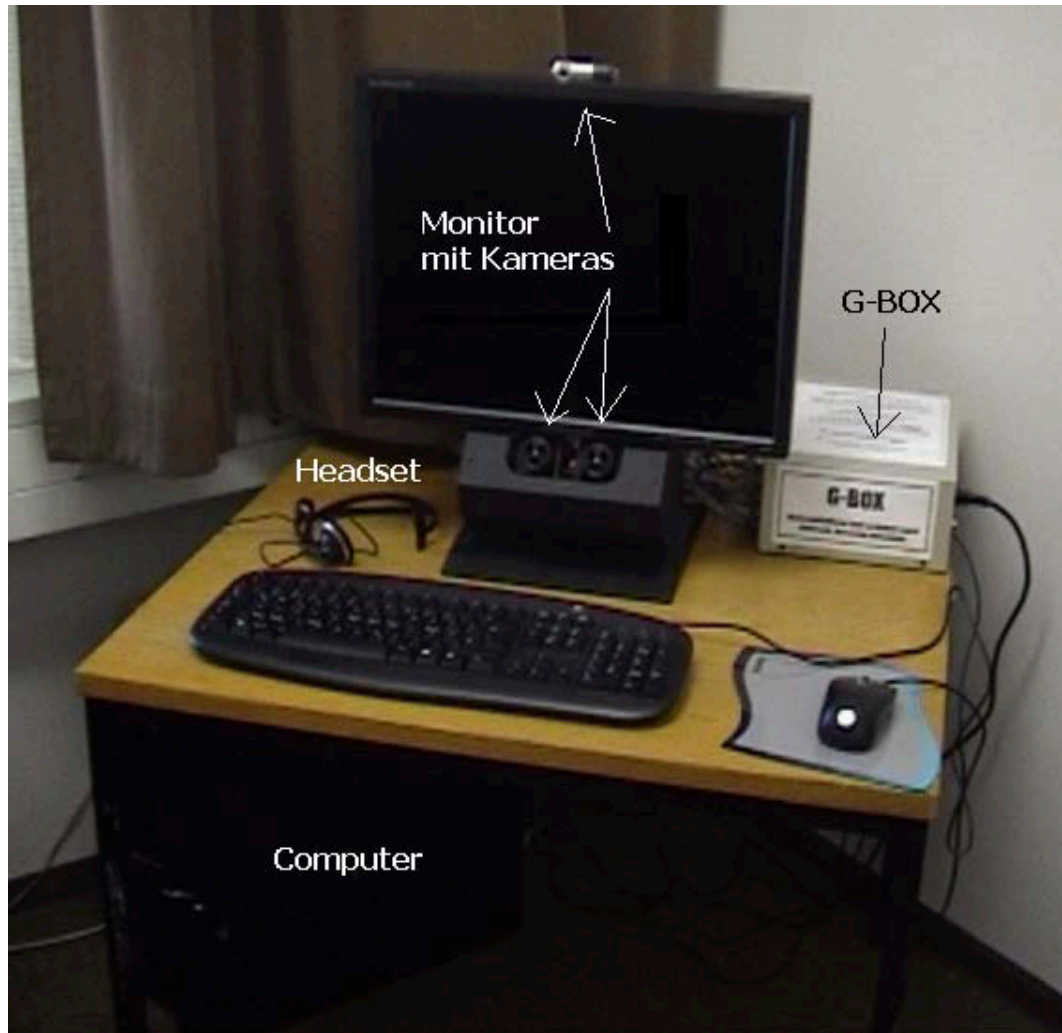
The documentation of eye movement over a scene which subjects have to verbalise displays patterns of **visual attention**

→ indirect measure of language processing

## Hypothesis

- features represented in the grammatical system will focus **ATTENTION** → **language-specific patterns of visual processing**

# Eye-Tracker



# Eye-Tracking

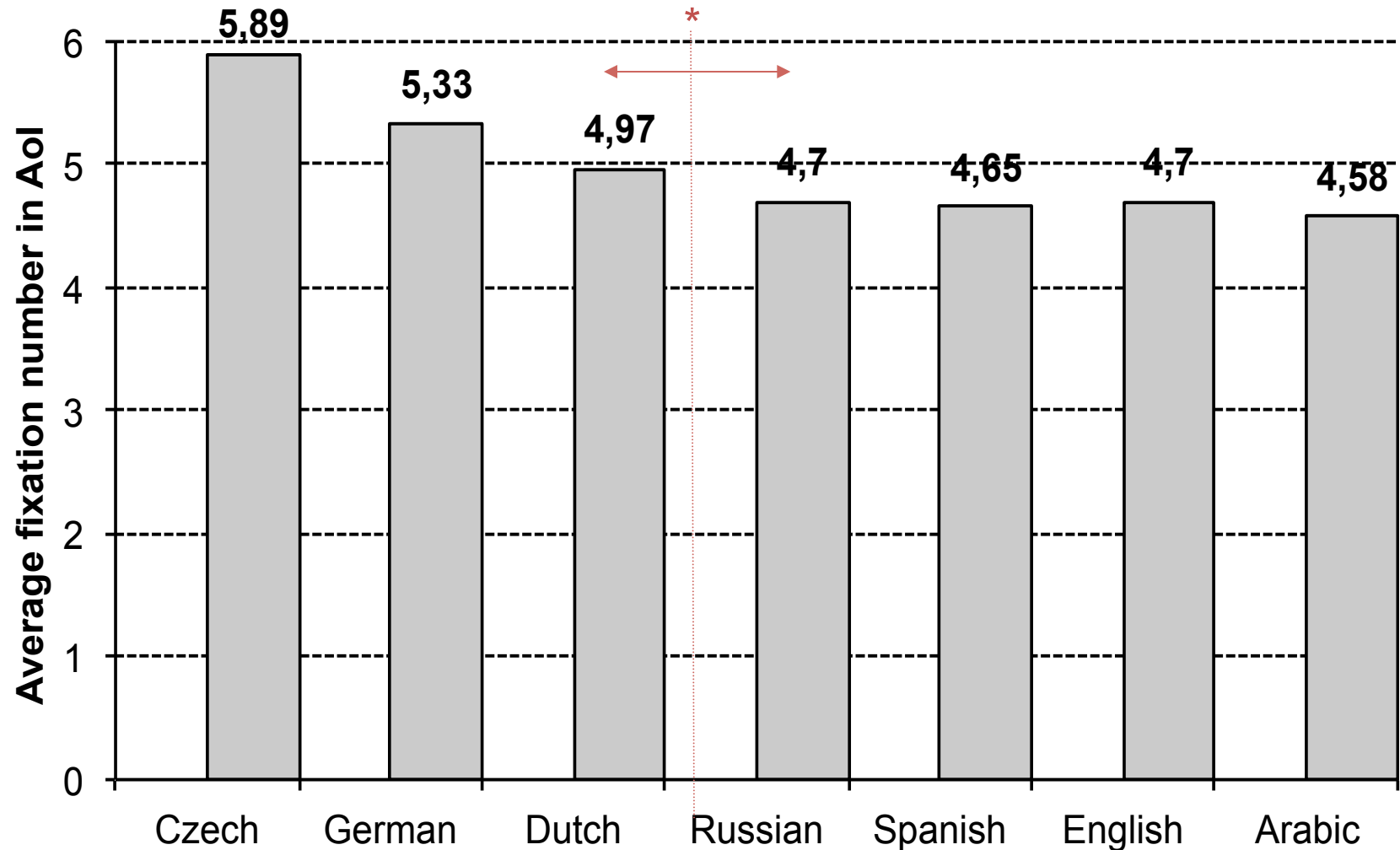
- **Aoi** - *area of interest (critical region)*
- **Saccade** - a fast, erratic movement of the eyes
- **Fixation**
  - the maintaining of the visual gaze on a single location
  - the point between any two saccades, during which the eyes are relatively stationary ... (e.g., Martin 1974)
- **Pass** – „*looking time*“

# Eye-tracking: Aol



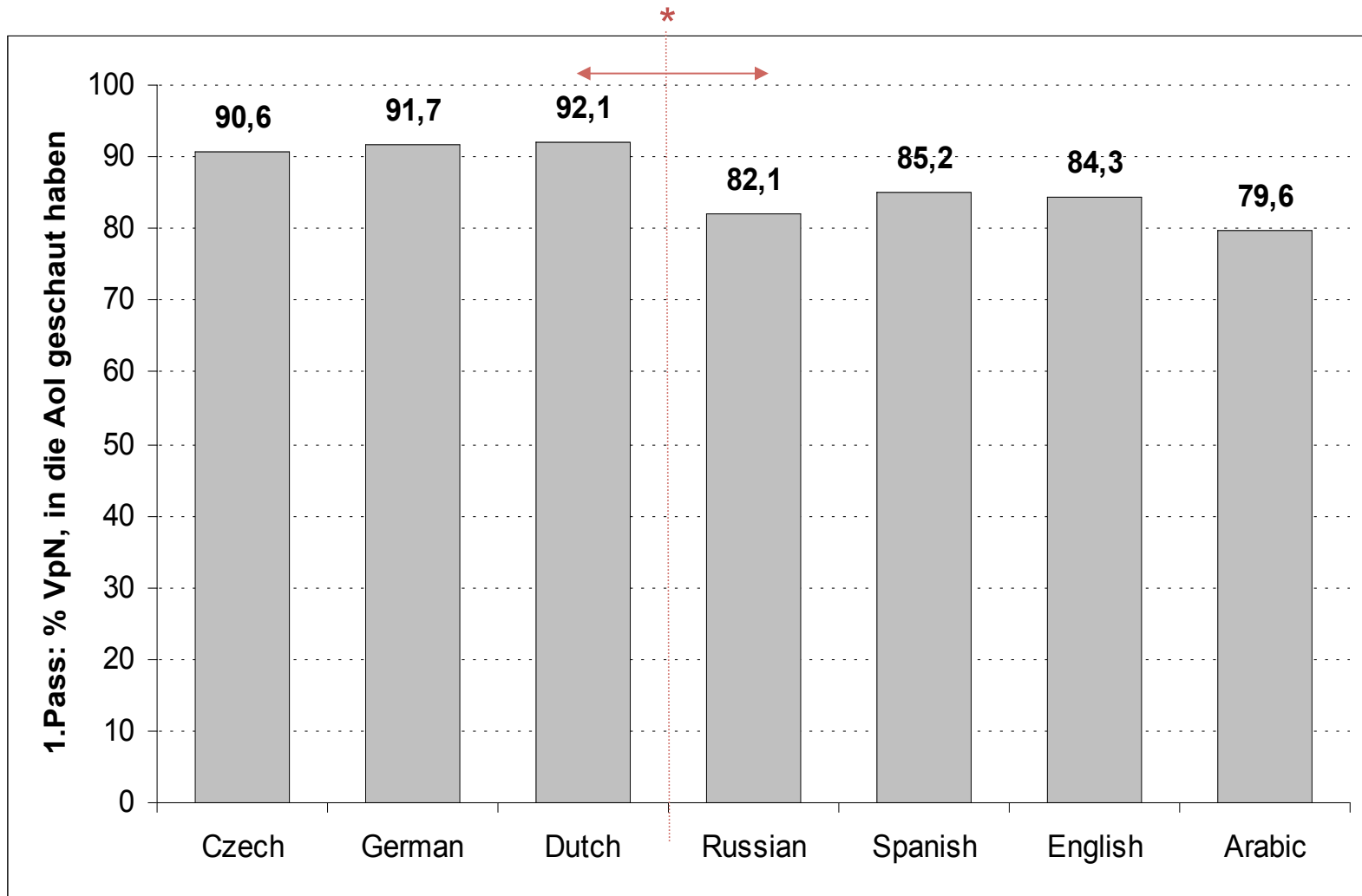
In *both* conditions the Aol involves one specific object (e.g., building, car, door of a building), which may differ slightly in size between individual items; however, a comparison between the two conditions should be justified

# Total number of fixations in the Aol



A two-way ANOVA; post hoc tests (Tukey);  $p < .05$

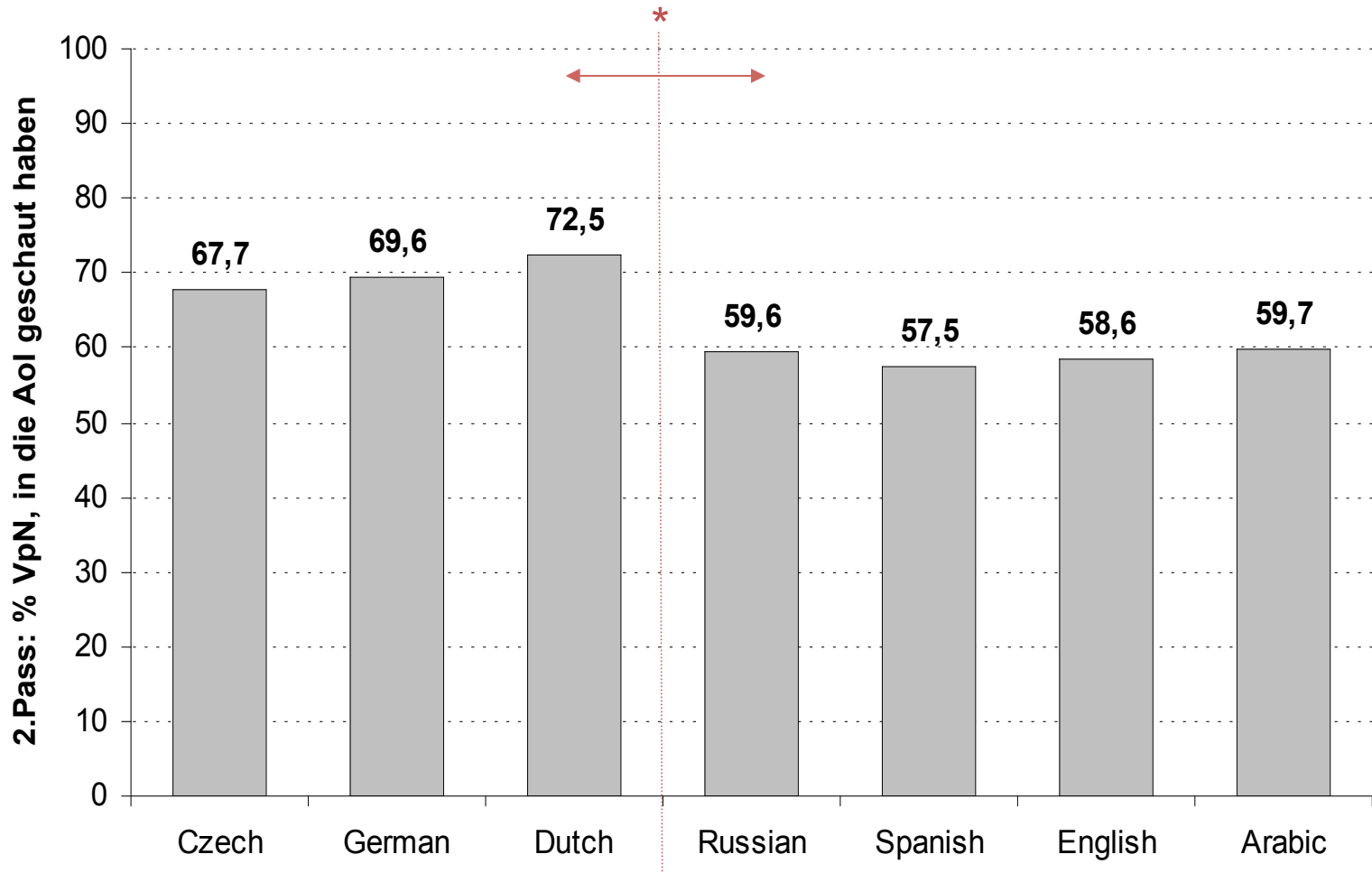
# 1<sup>st</sup>:Pass: % of subjects, who looked at least once into the AiO



A two-way ANOVA; post hoc tests (Tukey);  $p < .05$



# 2<sup>nd</sup> Pass: % of subjects, who looked at least once into the AiO



A two-way ANOVA; post hoc tests (Tukey);  $p < .05$

# Memory Tests

- **Hypothesis**

speakers of different languages will not remember the endpoints depicted in the motion events to the same extent

→ different groups of speakers focus their attention on different aspects of the scene

# Memory: examples

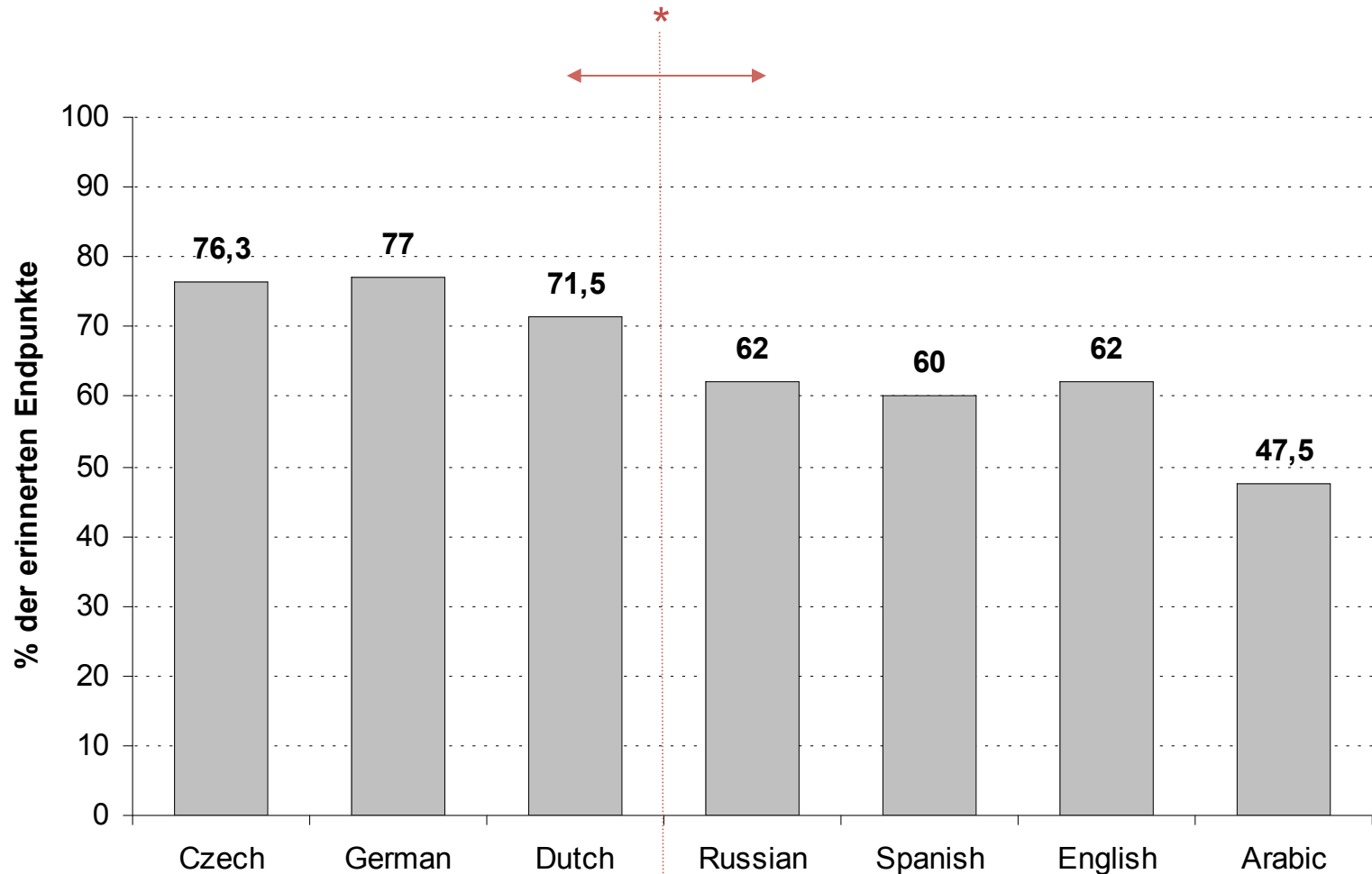
FILLER



-END



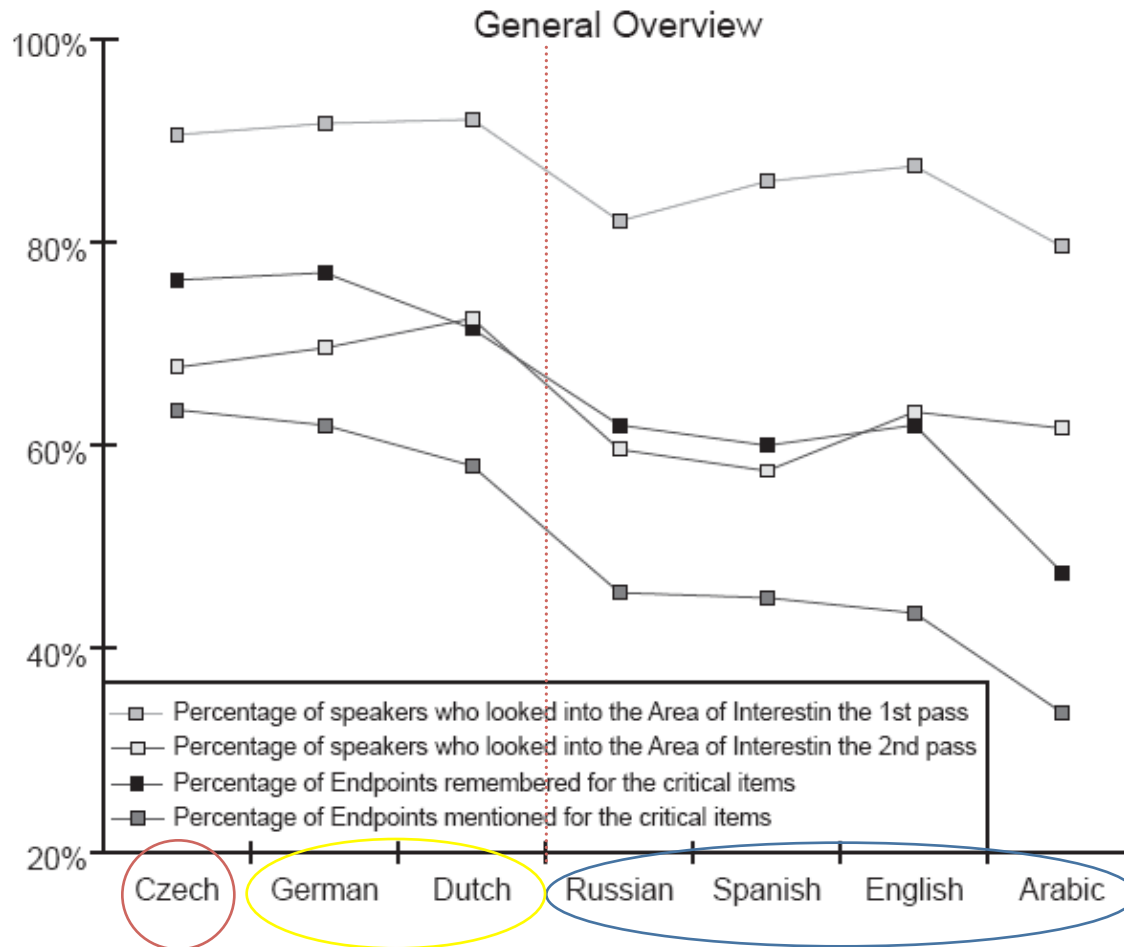
# % of remembered endpoints



critical items  $\chi^2(6) = 55.78; p < .05$

control items  $\chi^2(6) = 5.69; ns$

# General Overview



Language Contact between Czech and German?

# Study 02 - Conclusions

- Patterns of **event construal** differ in relation to the **grammatical** system of the source language
- Reflected in
  - !Effects found only for critical condition!
    - linguistic encoding of events
    - visual attention in Aol
    - memory of events

# Study 02 – Conclusions – cont.

**Grammaticalized structures** → play a crucial role in determining how speakers proceed in solving the manifold tasks of language production

- Evidence for **language-specific patterns** of event construal
- Differences deeply rooted in **planning processes** in speech production

**What does aspect do?**



# Perspectives on motion events



*Zwei Frauen laufen auf ein Haus zu*



*Two girls are walking along the road*



# Expression of a specific view on a particular event by means of grammar

FOCUS on **COMPLETION** => *holistic perspective*



*Zwei Frauen laufen zu einem Haus*

*Dvě ženy **jdou** ke stavení*

FOCUS on **PROGRESSION** => *phasal decomposition*



*Dve zensciny **idut** po doroge*

*Two women are walking along a road*

# III. Own research- Study 03

- **Studies**

Schmiedtová & Sahonenko, 2008

**Schmiedtová, 2011**

Schmiedtová, 2011a

v. Stutterheim et al., 2012

Schmiedtová, 2013

Schmiedtová, 2012, 2013a

# **ELICITATION, MEMORY, EYE-TRACKING – L2 SPEAKERS**

## **STUDY 03, Schmiedtová, 2011**

Do L2 speakers think in the L1 when speaking in the L2? In: *International Journal of Applied Linguistics*, 8, 97-122

# Experimental Design / Research Question

- The same design as in v. Stutterheim et al., 2012
- To what degree can advanced and very advanced L2+ speakers **learn to reorganize conceptual knowledge** in the direction of the target language?

# Participants

## Native Speakers

- L1 German; L1 Czech; L1 Russian

German N=21, ( $\bar{\emptyset}$  age: 25.4, range: 20-35), 10 females, 11 males

Czech N=21, ( $\bar{\emptyset}$  age: 22.1, range: 19-28), 13 females, 8 males

Russian N=21, ( $\bar{\emptyset}$  age: 24.3, range: 20-30), 11 females, 10 males

## L2 Speakers

- L1 Czech L2 German

N=21, ( $\bar{\emptyset}$  age: 29.9, age range: 20-59); 18 females, 3 males

- L1 Russian L2 German

N=21, ( $\bar{\emptyset}$  age: 27.3, age range: 22-38); 20 females, 1 male

# Analyses

## Encoding of endpoints

- **Linguistic analyses**

12 critical / 12 control items / 36 fillers

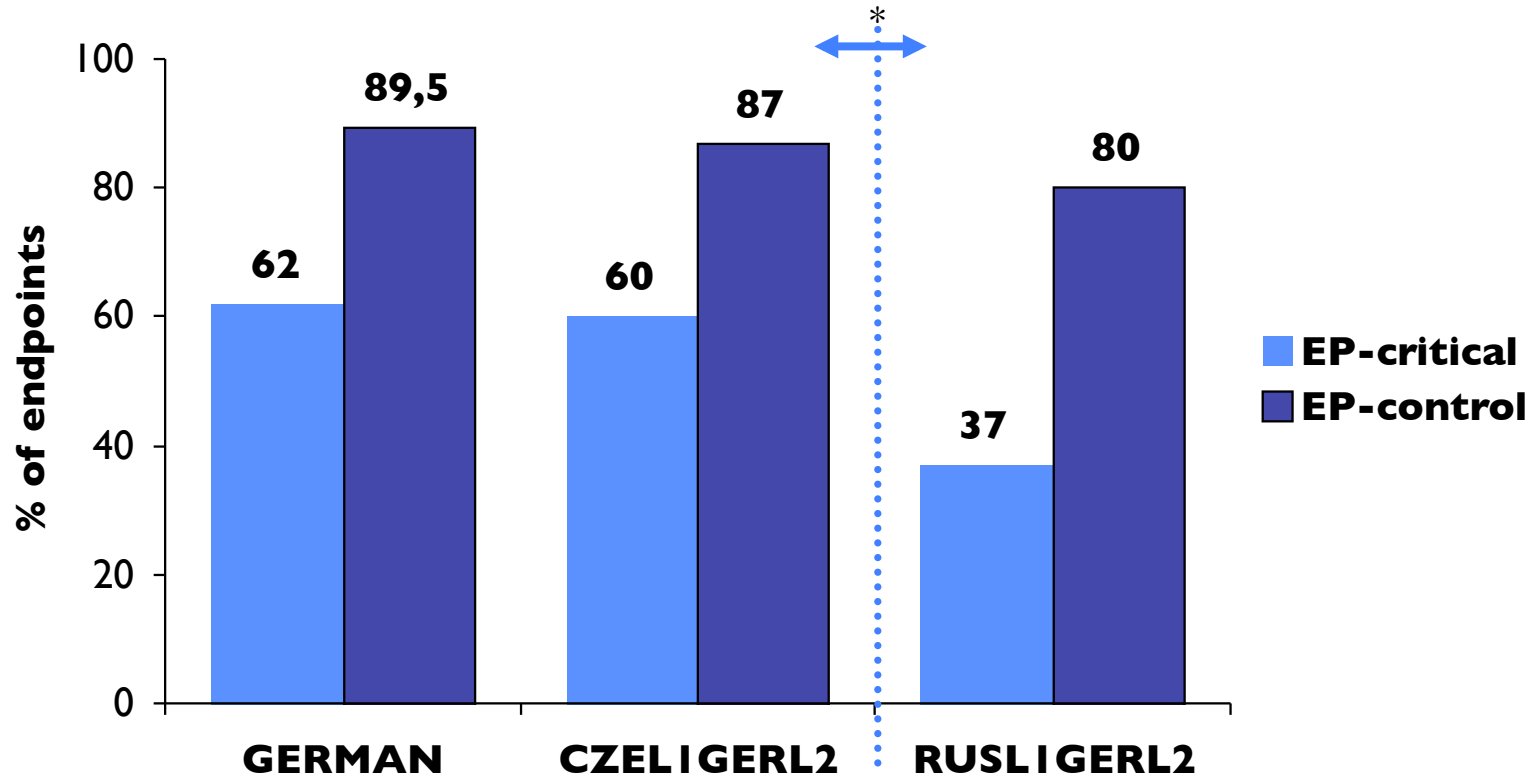
- **Memory Tests**

10 critical items / 5 fillers

- **Eye-tracking analyses (ET)**

12 critical / 12 control items / 36 fillers

# L2 speakers: endpoints in ling. task



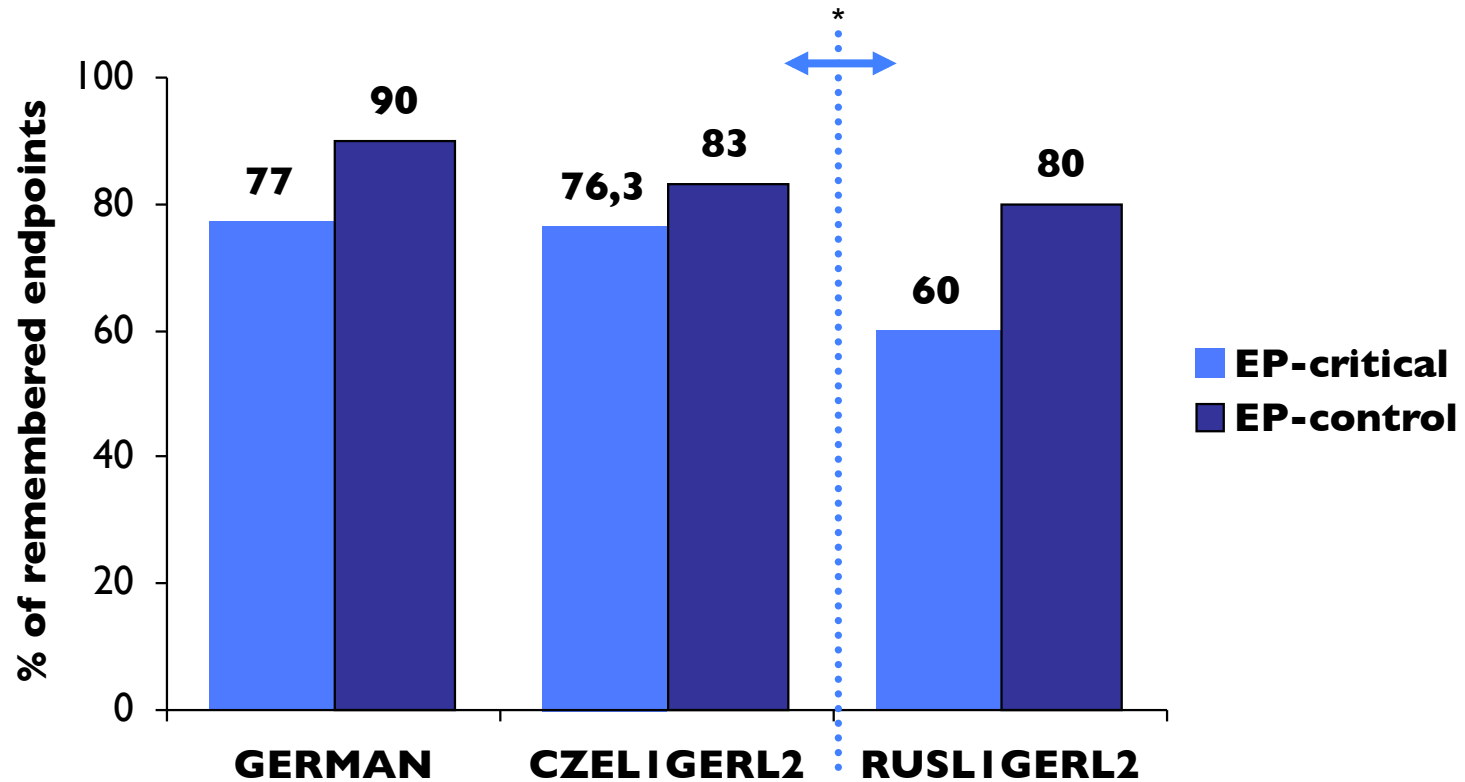
critical items  
control items

$$\chi^2(2) = 15.94; p < .05$$

$$\chi^2(2) = 1.38; ns$$



# L2 speakers: endpoints in memory task

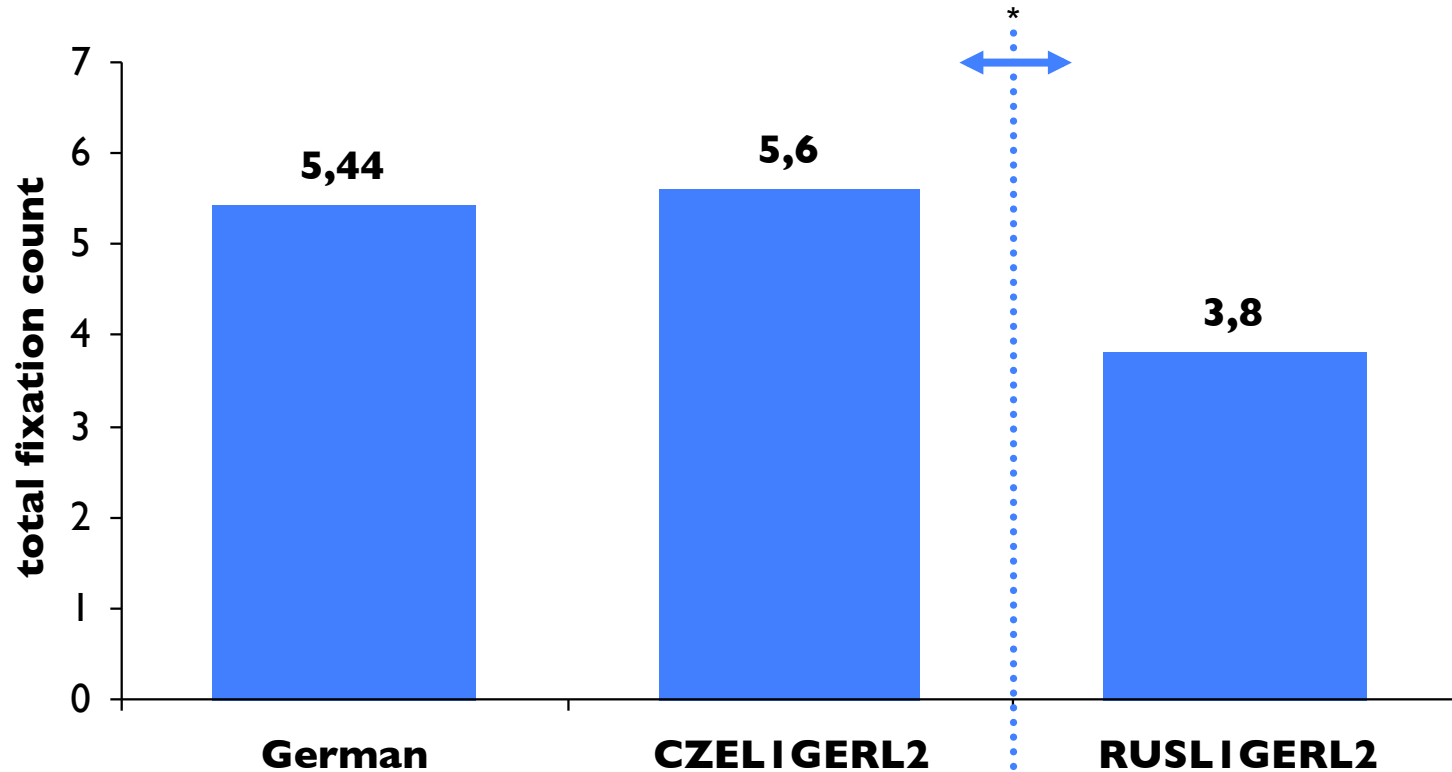


critical items  
control items

$$\chi^2(2) = 139.41; p < .05$$

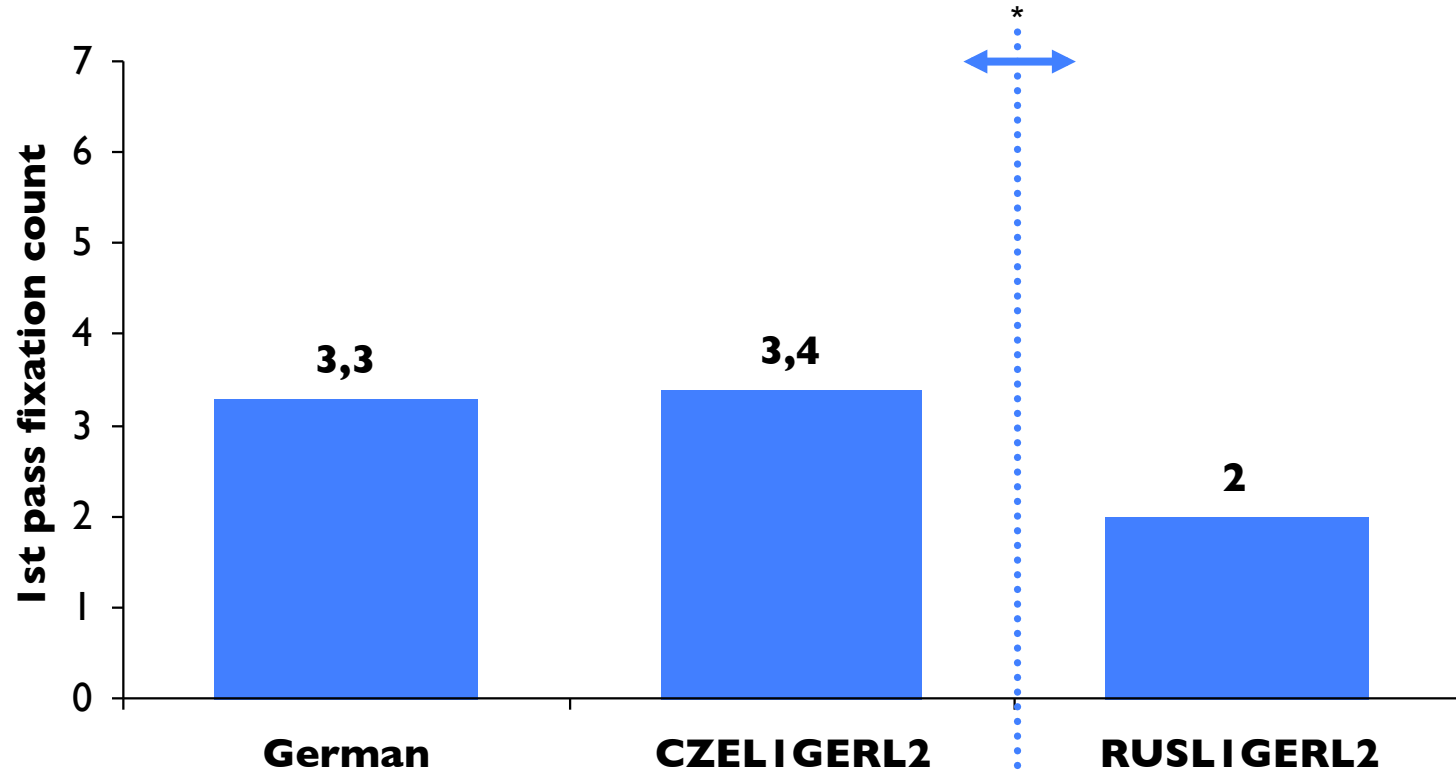
$$\chi^2(2) = 0.26; ns$$

# L2 speakers: Total Fixation Count



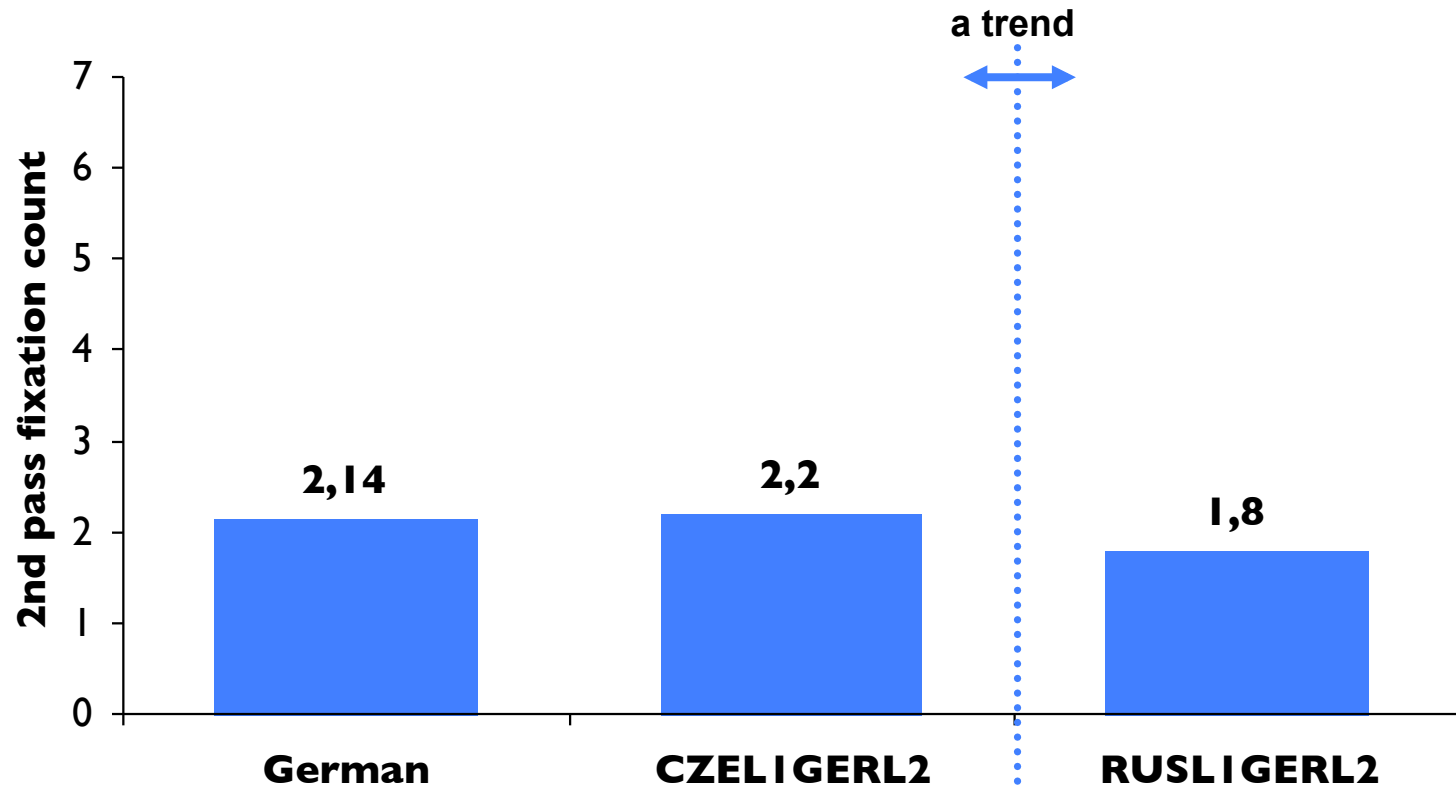
two-way ANOVA across participants ( $F1$ ); independent two-way ANOVA across items ( $F2$ ); post hoc tests (Tukey);  $p < .05$

# L2 speakers: 1st pass Fixation Count



two-way ANOVA across participants ( $F1$ ); independent two-way ANOVA across items ( $F2$ ); post hoc tests (Tukey);  $p < .05$

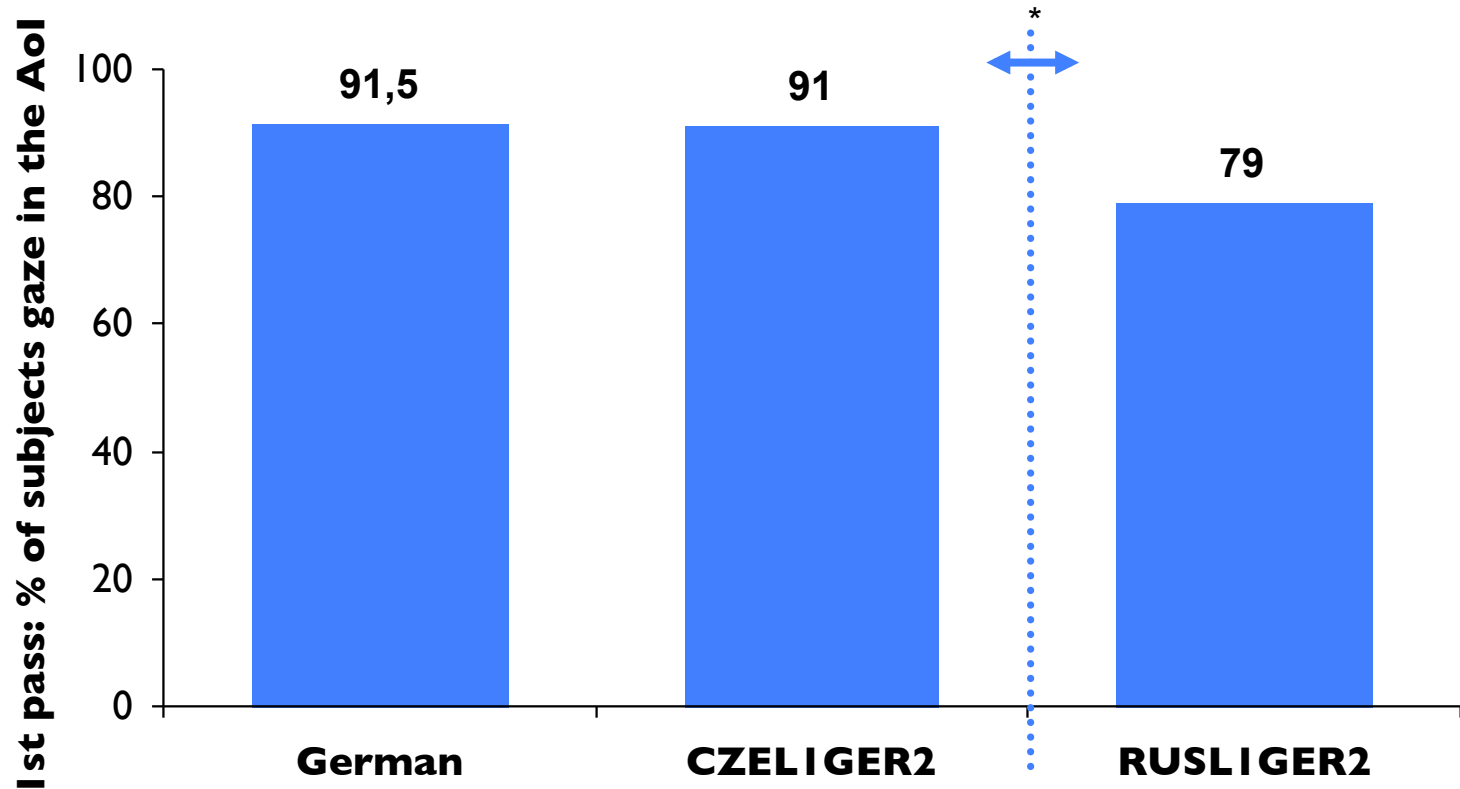
# L2 speakers: 2nd pass Fixation Count



two-way ANOVA across participants ( $F1$ ); independent two-way ANOVA across items ( $F2$ ); post hoc tests (Tukey);  $p = .06$

# L2 speakers: 1<sup>st</sup> pass

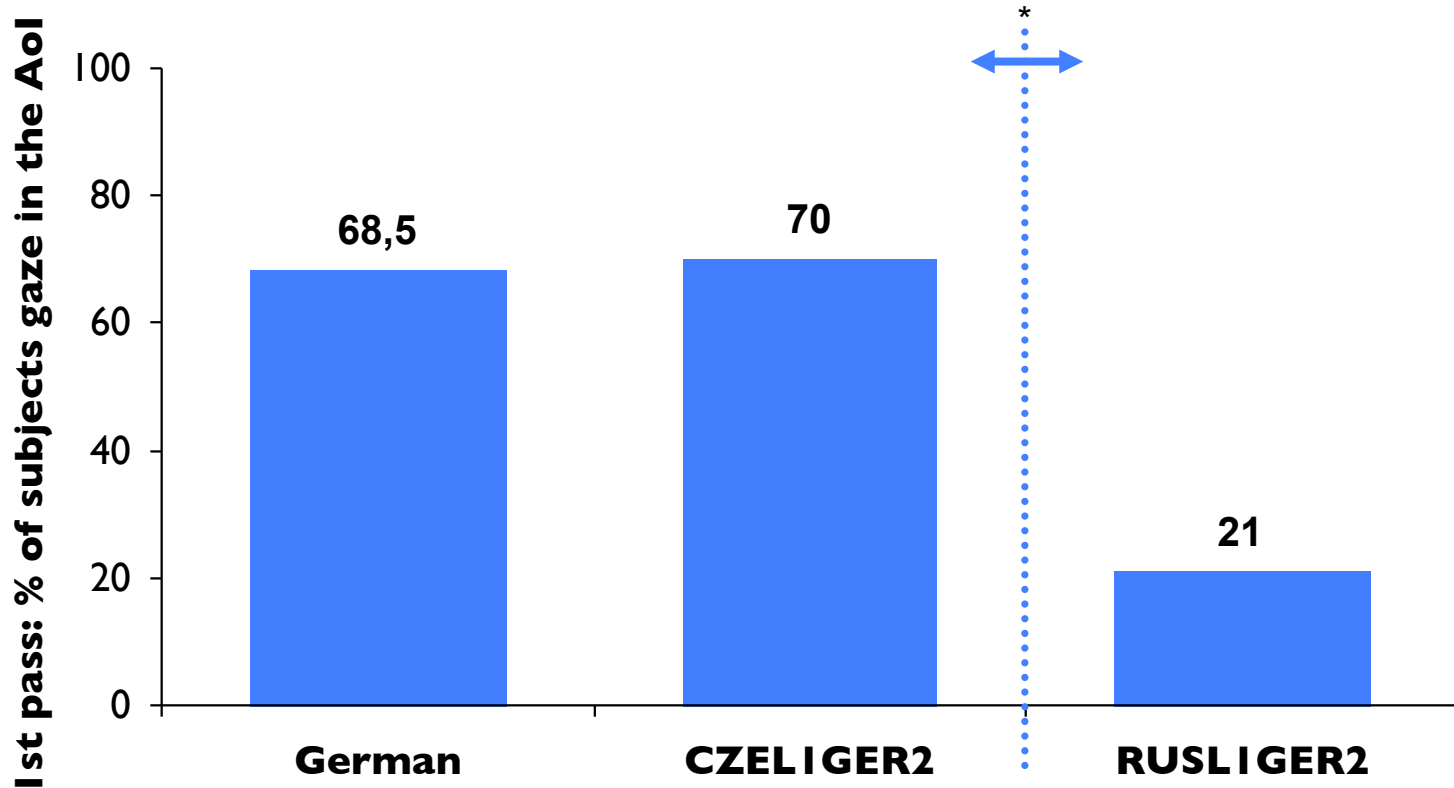
(% of L2-speakers who looked at least once in the AOI)



two-way ANOVA across participants ( $F1$ ); independent two-way ANOVA across items ( $F2$ ); post hoc tests (Tukey);  $p < .05$

# L2 speakers: 2<sup>nd</sup> pass

(% of L2-speakers who looked at least once in the AOI)



two-way ANOVA across participants ( $F1$ ); independent two-way ANOVA across items ( $F2$ ); post hoc tests (Tukey);  $p < .05$

# Study 03 - Conclusions

## L2-speakers do not fully learn principles of information organization of the target language

- extremely hard to recognize the role which grammaticalized means play in information organization → no one-to-one mapping of forms onto functions
- L2 learners acquire the new forms but often not the principles that are involved for **conceptualizing** content for speaking

# **Study 03**

## **Restructuring in a L2+**

As to the scope of restructuring → the results suggest that even for L2+ speakers with near-native command of the L2, conceptual knowledge of the type tested seems to be resistant to conceptual shift towards the target language



# III. Own research- Study 4

- **Studies**

Schmiedtová & Sahonenko, 2008

Schmiedtová, 2011

**Schmiedtová, 2011a**

v. Stutterheim et al., 2012

Schmiedtová, 2013

Schmiedtová, 2012, 2013a

# SPEECH ONSET TIMES

## STUDY 04, Schmiedtová, 2011a

Wie Sprache unser Denken formt - psycholinguistische Hintergründe. In: Susanne Schulte (ed.) *Ohne Wort keine Vernunft – keine Welt. Bestimmt Sprache Denken? Schriftsteller und Wissenschaftler im Wortwechsel mit Johann Georg Hamann*. Münster et al.: Waxmann Verlag, 97-128.

# Speech Onset Times (SOT)

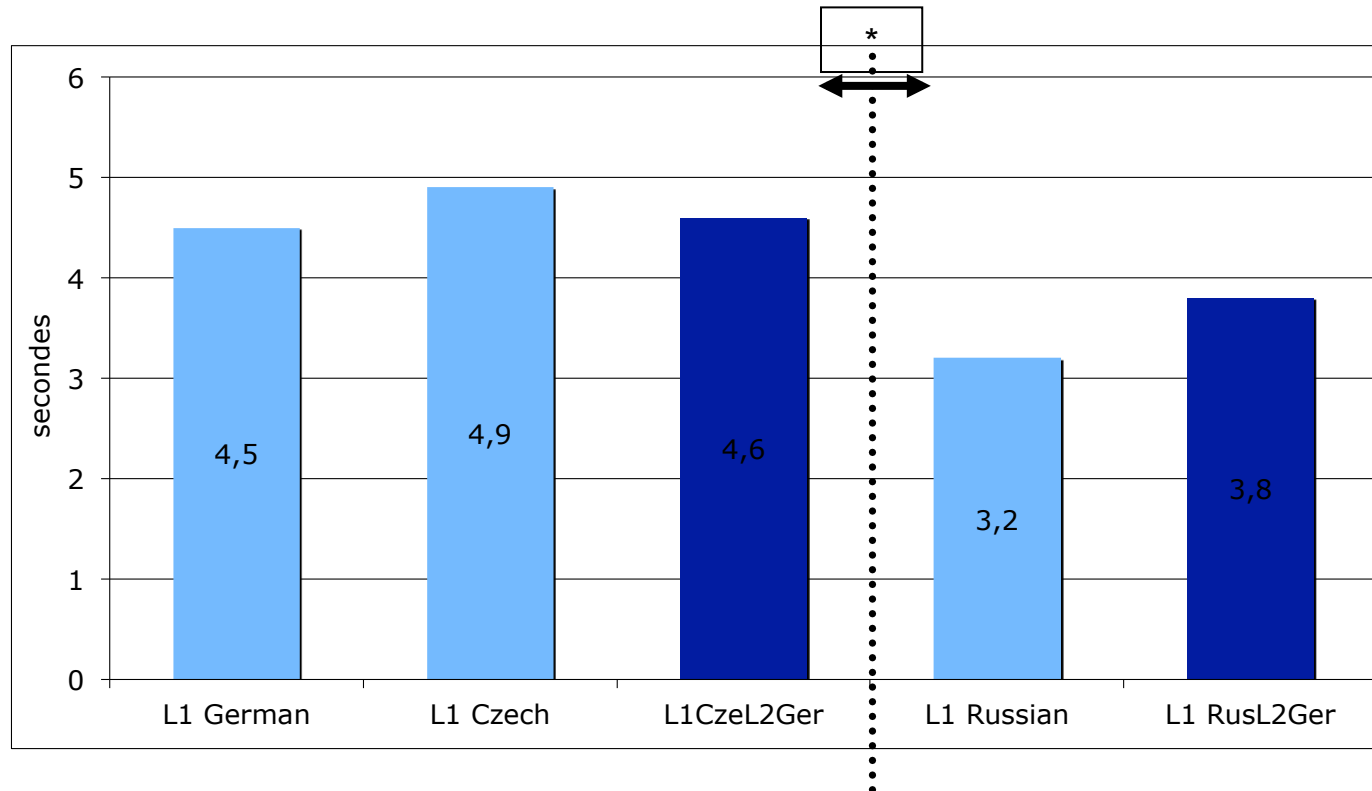
## Hypothesis

if “**a reportable event**” requires inclusion of an endpoint → a delay in SOT for scenes where the endpoint must be inferred

German and Czech native speakers need MORE time than Russian native speakers; similar pattern for L2-speakers

# Speech Onset Times

## L1 & L2



Motion events, N=10; 30 speakers per group

two-way ANOVA across participants ( $F1$ ); *independent two-way ANOVA* across items ( $F2$ ); post hoc tests (Tukey);  $p < .05$

# III. Own research- Study 05

- Studies  
Schmiedtová & Sahonenko, 2008  
Schmiedtová, 2011  
Schmiedtová et al, 2011  
v. Stutterheim et al., 2012  
**Schmiedtová, 2013**  
Schmiedtová, 2012, 2013a

# **ELICITATION - TIME PRESSURE**

## **STUDY 05, Schmiedtová, 2013**

Zum Einfluss des Deutschen auf das Tschechische: Die Effekte des Zeitdrucks auf die Sprachproduktion. In M. Nekula, K. Šíchová & J. Valdová (eds.). *Bilingualer Sprachvergleich und Typologie*. Tübingen: Stauffenburg Verlag, 177-206.

# Time Pressure: native speakers

To test the restrictions on **reportability**

→ elicitation of linguistic encoding under **time pressure**

Verbalizations of short scenes of everyday situations

- 37 short video clips, 6 sec long;
- 10 critical items (goal oriented motion), 27 fillers
- Randomized, **3 sec blanks**

On-line condition

- *You can start to speak as soon as you recognize what is happening in the clip?*
- Question in present tense
- The same instruction across all languages

# Time pressure: Participants

## Native Speakers

- L1 German; L1 Czech; L1 Russian

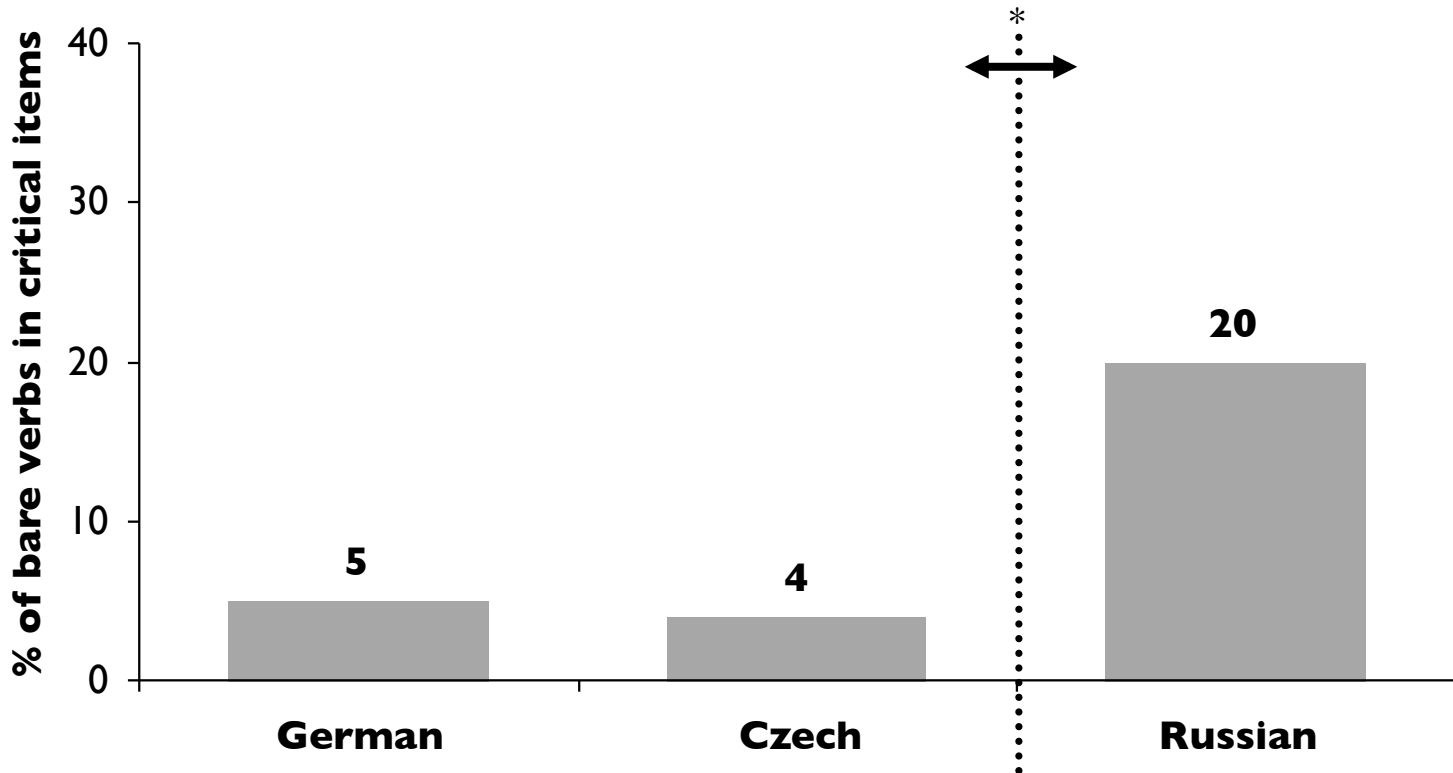
German N=22, ( $\bar{\emptyset}$  age: 24.8, range: 20-30),  
15 females, 7 males

Czech N=44, ( $\bar{\emptyset}$  age: 24.6, range: 19-36),  
30 females, 14 males

Russian N=20, ( $\bar{\emptyset}$  age: 26.1, range: 22-33),  
14 females, 6 males



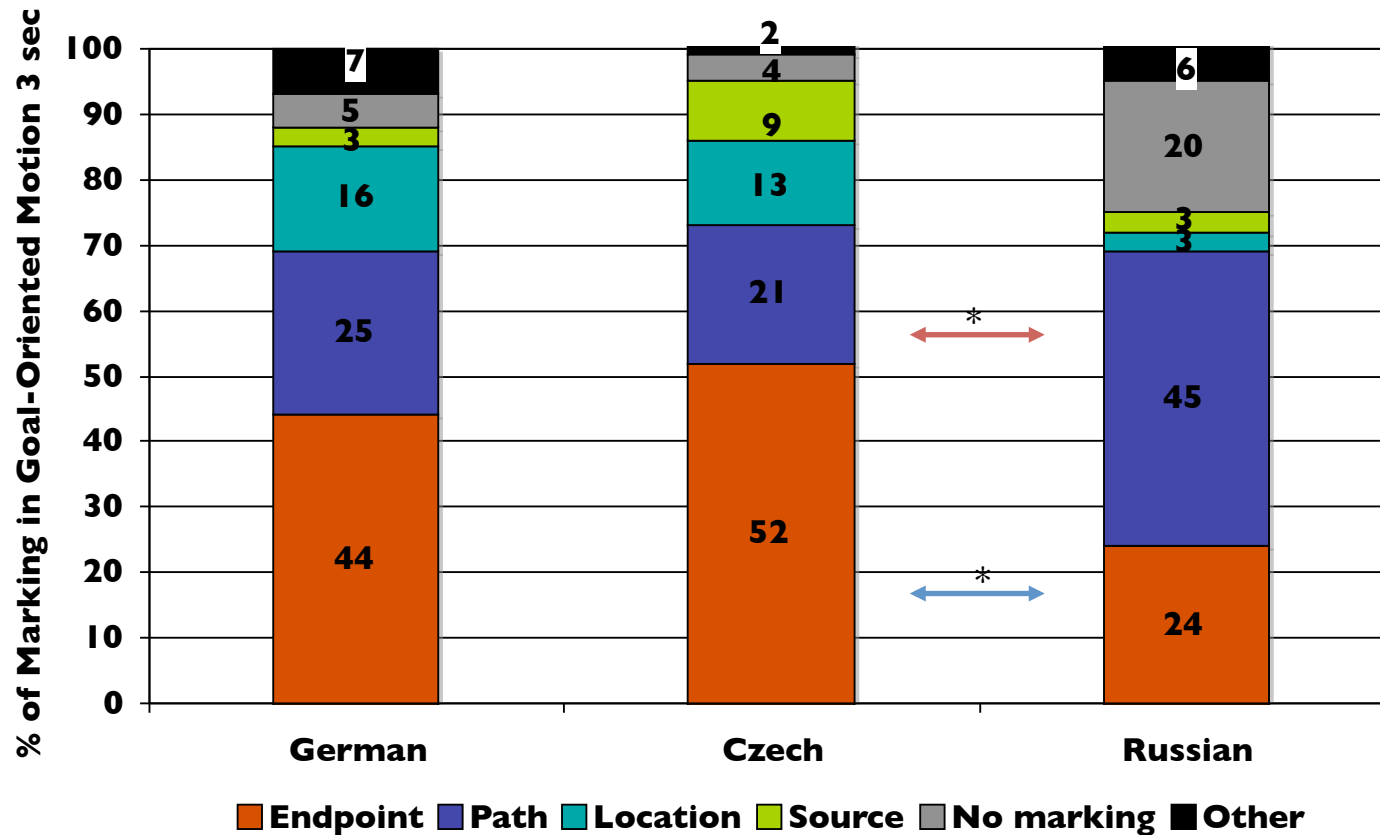
# L1 speakers: the use of bare verbs under time pressure



German vs. Russian:  $\chi^2(1) = 250.4; p < .05$   
Russian vs. Czech:  $\chi^2(1) = 382; p < .05$   
German vs. Czech:  $\chi^2(1) = 0.15; ns$

?? Zwei Frauen laufen  
?? Ein Auto fährt

# LI speakers: goal-oriented motion under time pressure



# **LANGUAGE CONTACT HYPOTHESIS**

# III. Own research- Study 06

- Studies  
Schmiedtová & Sahonenko, 2008  
Schmiedtová, 2011  
Schmiedtová et al, 2011  
v. Stutterheim et al., 2012  
Schmiedtová, 2013  
**Schmiedtová, 2012, 2013a**

# Preference Judgment task

## STUDY 06, Schmiedtová, 2012, 2013a

1. Untersuchung zu Sprache und Kognition am Beispiel von Ereigniskonzeptualisierung und Textkohärenz im Deutschen und Tschechischen, Habilitation, Ruprecht-Karls Universität Heidelberg, 2012; will be published in de Gruyter in 2015.
2. Zur Verwendung der perfektiven Präsensform im heutigen Tschechisch. In *Journal for Central European Studies*, special issue, Paliga, S. (ed.), Editura Universității București, 125-164.

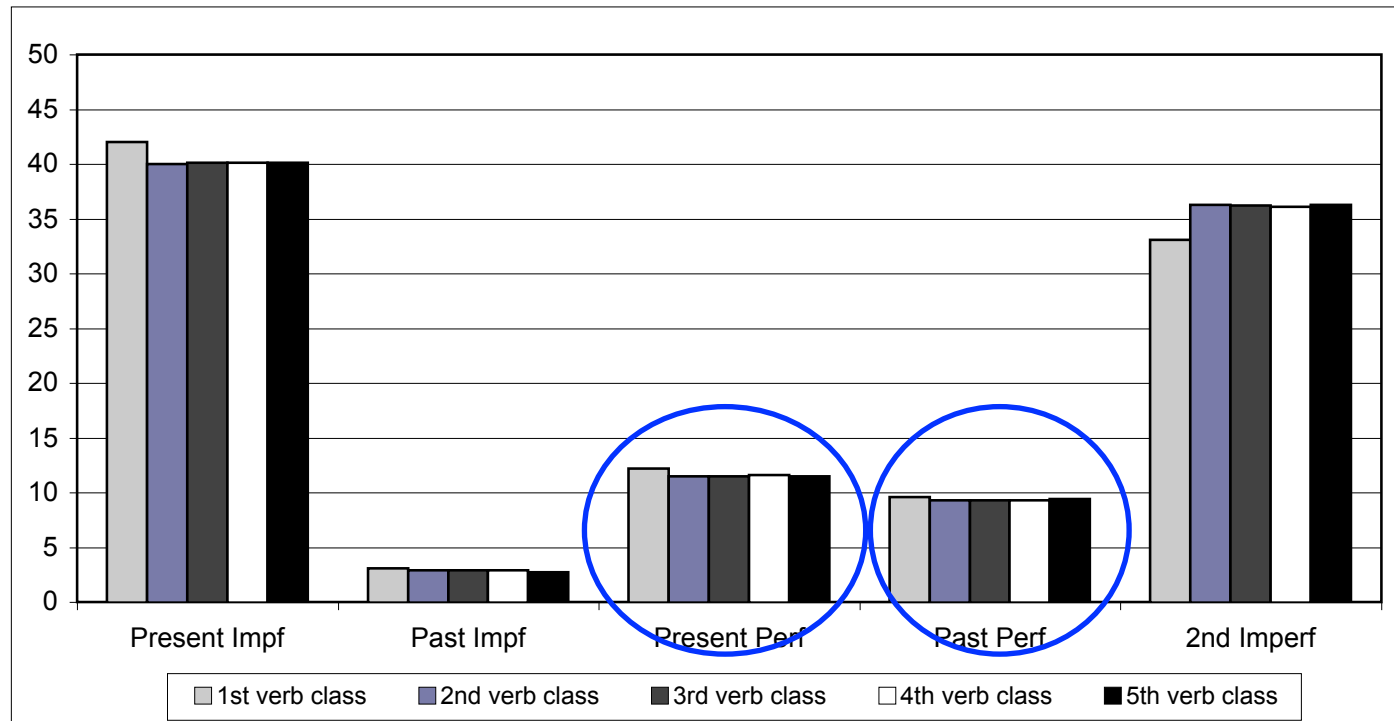
# Preferential judgment task

- 256 participants
- five different regions of the Czech Republic;
- 15 critical items (three verbs per verb class) – no motion events
- 20 fillers (motion verbs)



# The use of the present perfective across all verb classes in Czech

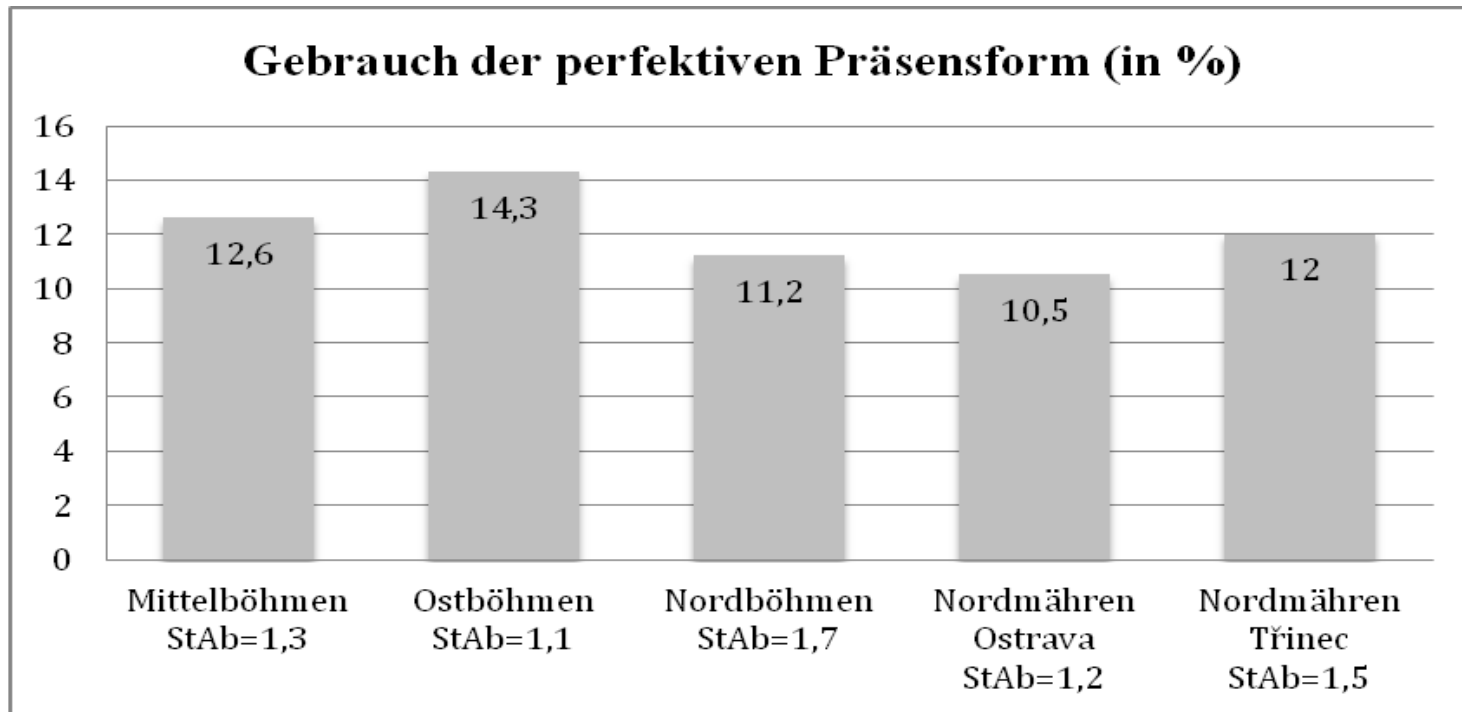
Present Perfective Use - on average 12.1 %



N=256; five different regions of the Czech Rep.;  
15 critical items (three verbs per class); 20 fillers

# The use of the present perfective in different regions

no differences

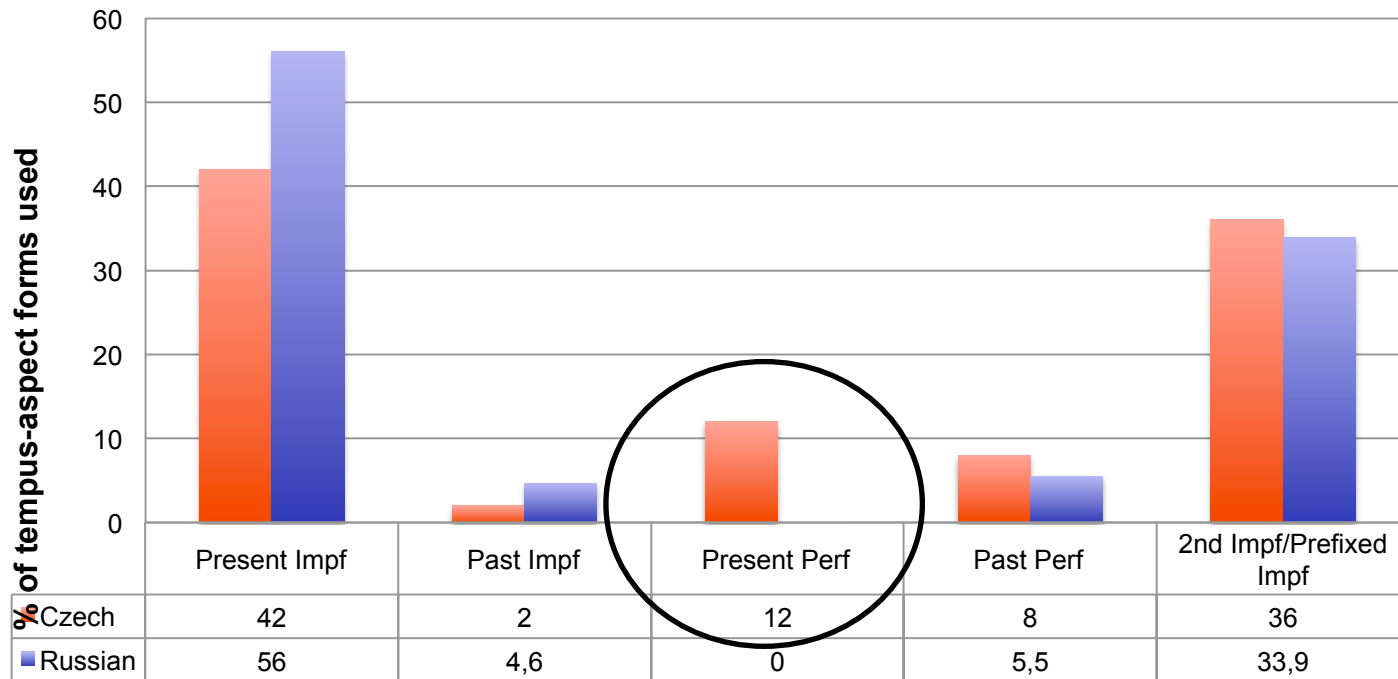


N=256; five different regions of the Czech Rep.;  
15 critical items (three verbs per class); 20 fillers

East Bohemia (the highest percentage) vs. North Moravia-Ostrava the lowest percentage):  $z = 0.46, n.s.$



# The use of the present perfective in Czech and Russian



N=35 Russian native speakers

15 critical items (three verbs per verb class); 20 fillers

# Conclusion I: on Czech

- re-analysis of the **perfective** allows for the integration of resultant states / endpoints under the perspective of **the deictic now** that is expressed as the combination of a perfective (event marked as complete) & the present tense under a present tense reading
- the **imperfective** form seems to be pushed out by the perfective form → preference for the **holistic perspective** in **motion** events as well events with **resultative state**
- the **perfective** form extends its domain of application to the here-and-now reading



# Conclusion I: on Czech

- re-analysis of the **perfective** allows for the integration of resultant states / endpoints under the perspective of **the deictic now** that is expressed as the combination of a perfective (overlapped by the present tense) and a present tense underpinning  
**Due to the long lasting contact with the German language...**
- the **imperfective** form seems to be pushed out by the perfective (overlapped by the present tense) and a present tense underpinning  
**not only lexicon, but also grammar and the underlying concepts with resultative state**
- the **perfective** form extends its domain of application to the here-and-now reading  
See also Berger, 1993, 2008; Dickey in press, 2011

# IV. Closing remarks

- **Hypothesis development** → takes time; follow up experiments very important
- **Data coding**
  - Different coders
  - Intercoder agreement
- **Data analysis**
  - a combination of qualitative and **quantitative** analyses (inferential statistics) → data presentation
    - descriptive statistics ≠ inferential statistics
  - the use of parametric statistics for nominal linguistic data in my opinion very problematic

# IV. Closing remarks – cont.

- Experimental design
  - PILOTING is vital
  - Fillers and critical/control items must be carefully chosen; randomization  
  - Enough subjects → homogenous group
- Combination of methods a good thing
  - e.g., corpus analyses in order to generate a specific hypothesis
  - Case studies provide also relevant insights

# IV. Closing remarks – cont.

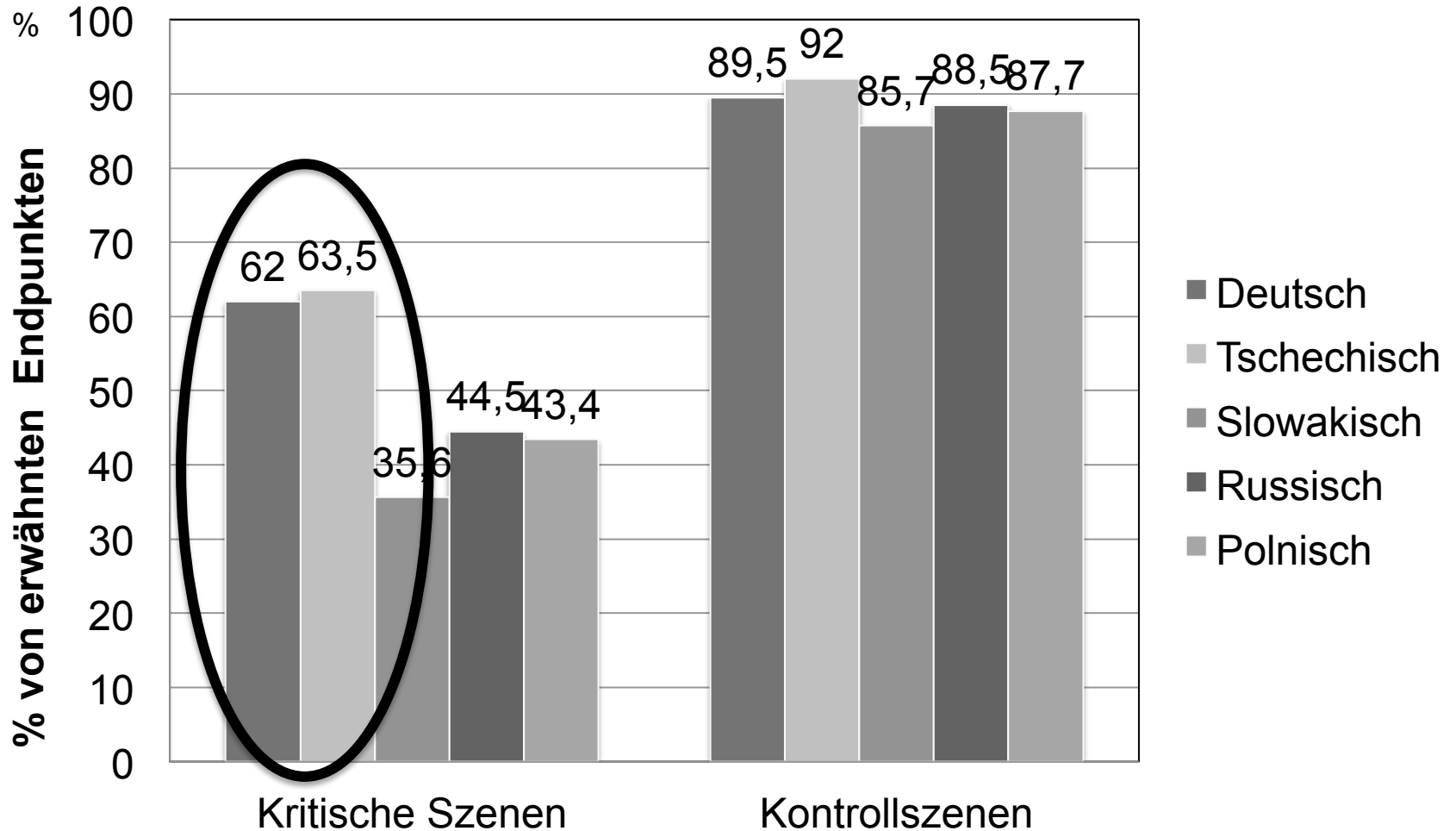
- Cross-linguistic research
  - difficulties in translating / transferring stimuli across languages

... and many more

**Thank you for your  
attention**

**[mertins@idf.uni-heidelberg.de](mailto:mertins@idf.uni-heidelberg.de)**

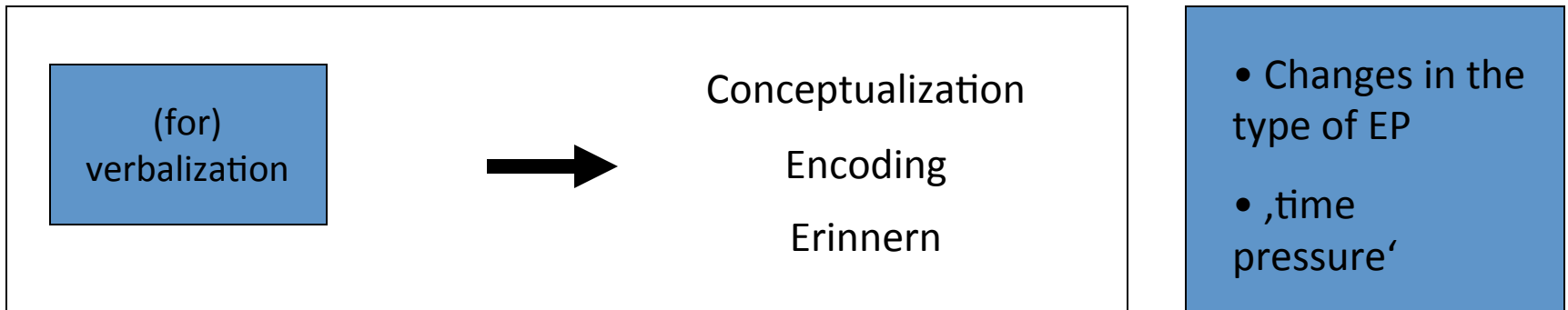
# Goal-oriented motion: German vs. different Slavic languages





# ,Direction‘

- A prior linguistic task
  - *Seeing/Thinking for Speaking*



- Without any linguistic task
  - e.g., *change blindness*

z.B. [http://gocognitive.net/sites/default/files/change\\_blindness.v.0.93\\_0.swf/](http://gocognitive.net/sites/default/files/change_blindness.v.0.93_0.swf/)