

Corpus Project of German Sign Language: State of the Art



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... as well as B.A. and M.A. students contact persons
in various German regions and Deaf informants

Structure of the Talk

I. Outline

2. Importance of Data-Driven and Corpus-based Work in Contemporary Sign Language Research

3. Two Goals of DGS Corpus Project: An Overview

4. Corpus-based Methodology

4.1. Data Collection

4.2. Data Annotation

5. Corpus-based Analyses: Some Implications

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I. Outline

Importance of Data-Driven and Corpus-based Work in Sign Language Research

Neidle et al:

„Many theoretical controversies may, in fact, be a consequence of **inadequate means for written transcription and reporting of visual-gestural data.**“



2. Importance

Importance of Data-Driven and Corpus-based Work in Sign Language Research

Neidle et al:

„This has precluded both **the replicability of results** and **accessibility of the raw data for direct inspection by the scientific community**“

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<http://www.bu.edu/asllrp/2.html>, accessed on Jan 26 2013

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Importance of Data-Driven and Corpus-based Work in Sign Language Research

Neidle et al:

„Glosses are **inconsistent and frequently ambiguous or misleading**. Reliance on glosses may well have given rise to **incompatible and contradictory theoretical claims** found in the literature“

<http://www.bu.edu/asllrp/2.html>, accessed on Jan 26 2013

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Gebärden-Lexikon

1

Grundgebärden

h



| | | | | |
|----------|-----------|-----------|---------|--------|
| Eisen | Holz | Papier | Feuer | Wasser |
| | | | | |
| Bahn | Fahren | Reisen | Gehen | Wette |
| | | | | |
| Gewinnen | Verlieren | Alt | Jung | Neu |
| | | | | |
| Fleissig | Faul | Brav | Schlimm | Falsch |
| | | | | |
| Reich | Arm | Schwindel | Lüge | Lump |
| | | | | |



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2. Importance

Properties:

- (i) Authenticity
- (ii) Size
- (iii) Sampling
- (iv) Representativeness
- (v) Balance

(Tognini-Bonelli 2001:47-64)

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„Representativeness refers to the extent to which a sample includes the full range of variability in a population.”

(Biber 1993:243)

2. Importance

auslan signbank

SIGN SEARCH
MEDICAL SIGNS ONLY

Home Dictionary Grammar Corpus Research

THE CORPUS WILL BE OPENLY ACCESSIBLE FROM 2012. REQUESTS FOR ACCESS BEFORE THAT DATE SHOULD BE DIRECTED TO THE [ENDANGERED LANGUAGES ARCHIVE \(ELAR\), UNIVERSITY OF LONDON](#).

THE AUSLAN CORPUS

The Auslan Corpus consists of the movies in the Auslan Archive together with linked linguistic annotation files. The Auslan Archive was funded by the Endangered Languages Documentation Program within the School of Oriental and African Studies (SOAS) at the University of London. The primary aim of the project was two-fold: first, to create and secure a reference archive of Auslan, as an endangered language, in the face of the decreasing numbers of deaf sign language users (a decrease which is projected to accelerate); and, second, to create a linguistic Corpus for the study and description of the language both now and into the future.

**E·S·R·C
ECONOMIC & SOCIAL RESEARCH COUNCIL**

British Sign Language Corpus Project

Home | Project Information | The Team | Data | Contact | Get Involved | Publications and Presentations | Events | Links | News

Data Home

Welcome! Choose below from two different ways in which you can look at the video data from the BSL Corpus.



Polish Sign Language (PJM)



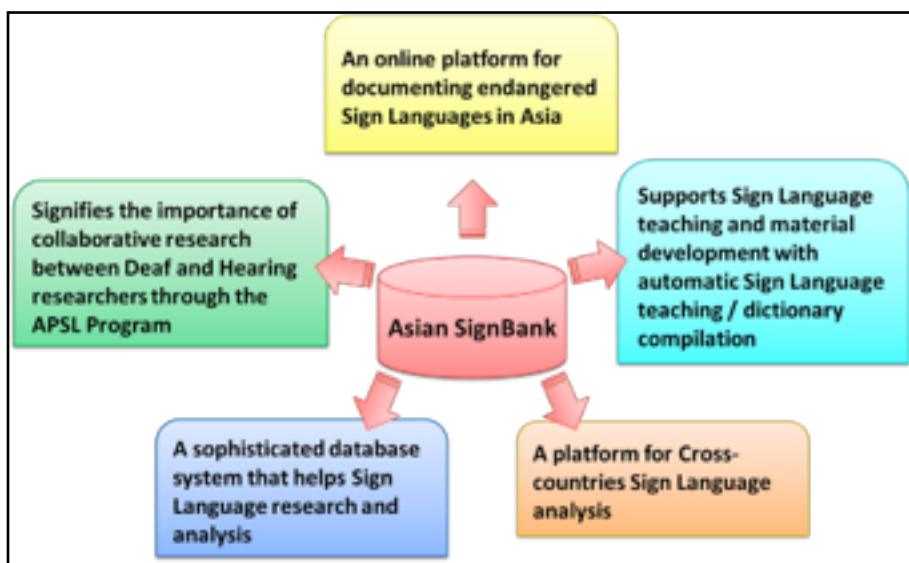
PJM (PSL) corpus

Section for Sign Linguistics, University of Warsaw, has begun corpus research on PJM(Polish Sign Language). In creating this corpus, Deaf from all over the country, are recorded. Corpus research are the basis for the development of Sign Linguistics. Currently in Poland there is no Polish Sign Language(PJM) dictionary, nor is there any description of the language's grammar. Their development will be possible by completing the recordings, and their further annotation and analysis. The Corpus will provide a documentation of the Sign Language's history and development. Corpus research conducted by the Section for Sign Linguistics fall within the global trend of analysis as regards corpus linguistics of visual-spatial languages.

Radboud University Nijmegen

Corpus NGT (Researchers)

Sign Linguistics Corpora Network



2. Importance

Two Goals I

- Reference corpus of German Sign Language (DGS)
- Corpus-based Dictionary of DGS - German

The Reference Corpus

- 330 informants from 13 regions
- 540 hours of signed material; approx. 2.5 million tokens
- Metadata on informants' linguistic and social background including place of residency, place of (pre-)schooling etc.
- Tokenized, lemmatized and annotated
- publication of selected parts of the reference corpus
- for language documentation, resource for basic linguistic research, resource for Deaf studies

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3. Goals

Two Goals II

- Reference corpus of German Sign Language (DGS)
- Corpus-based Dictionary of DGS - German

Corpus-based Electronic DGS-German Dictionary

- approx. 6000 sign entries (planned)
- Bidirectional: search via sign form or written word
- Sign entries including information on form, meaning, grammar, variants and usage
- Cross references to related and similar signs
- Dictionary grammar

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3. Goals

4.1 Corpus-based Methodology: Data Collection => Sociolinguistic Variable I: Region

12 Collection sites

13 Regions

- ▶ divided into subregions



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4. I Corpus-based Methodology: Data Collection

Mobile Studio

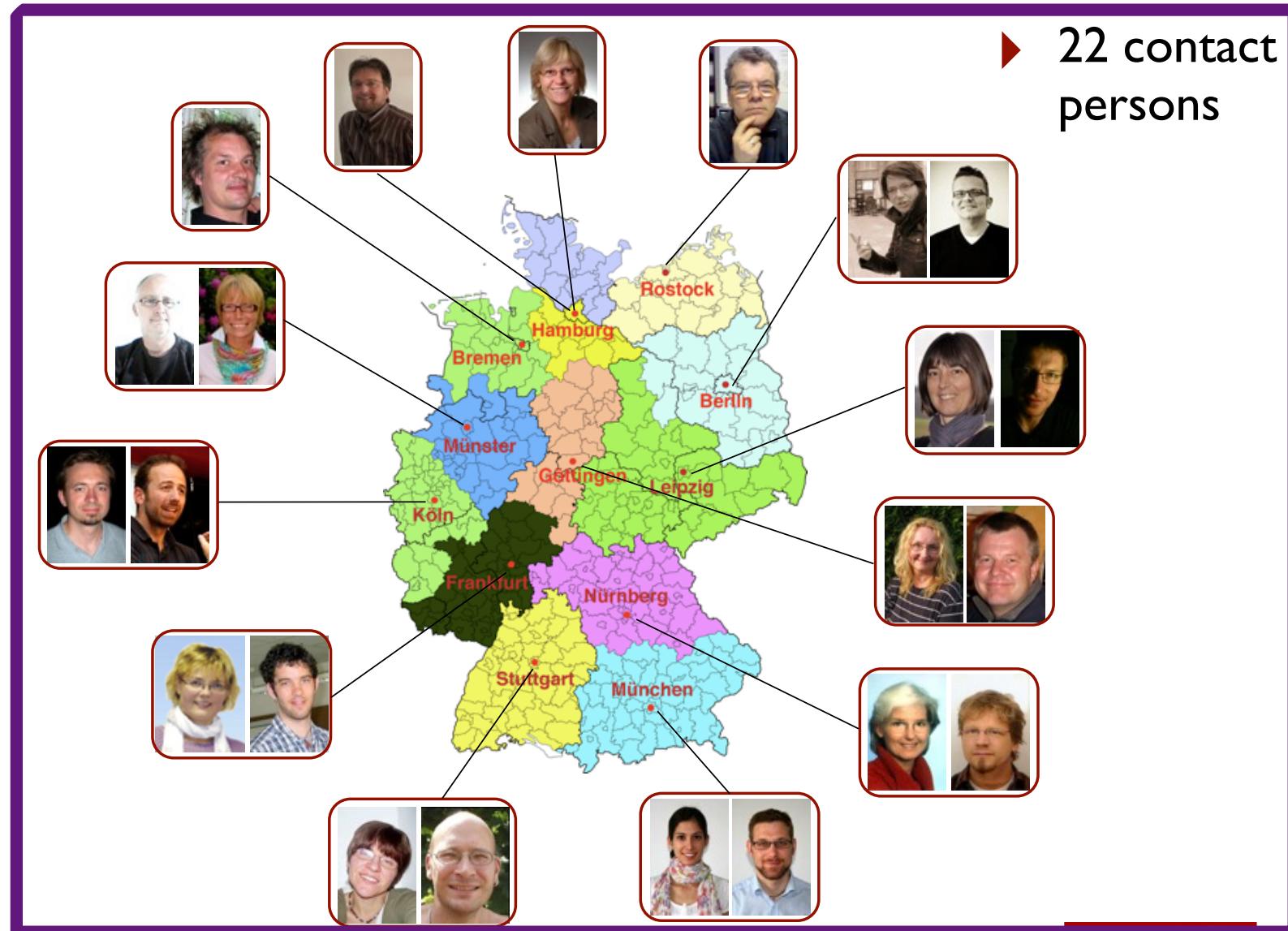


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4. I. Data Collection

4. I Corpus-based Methodology: Data Collection



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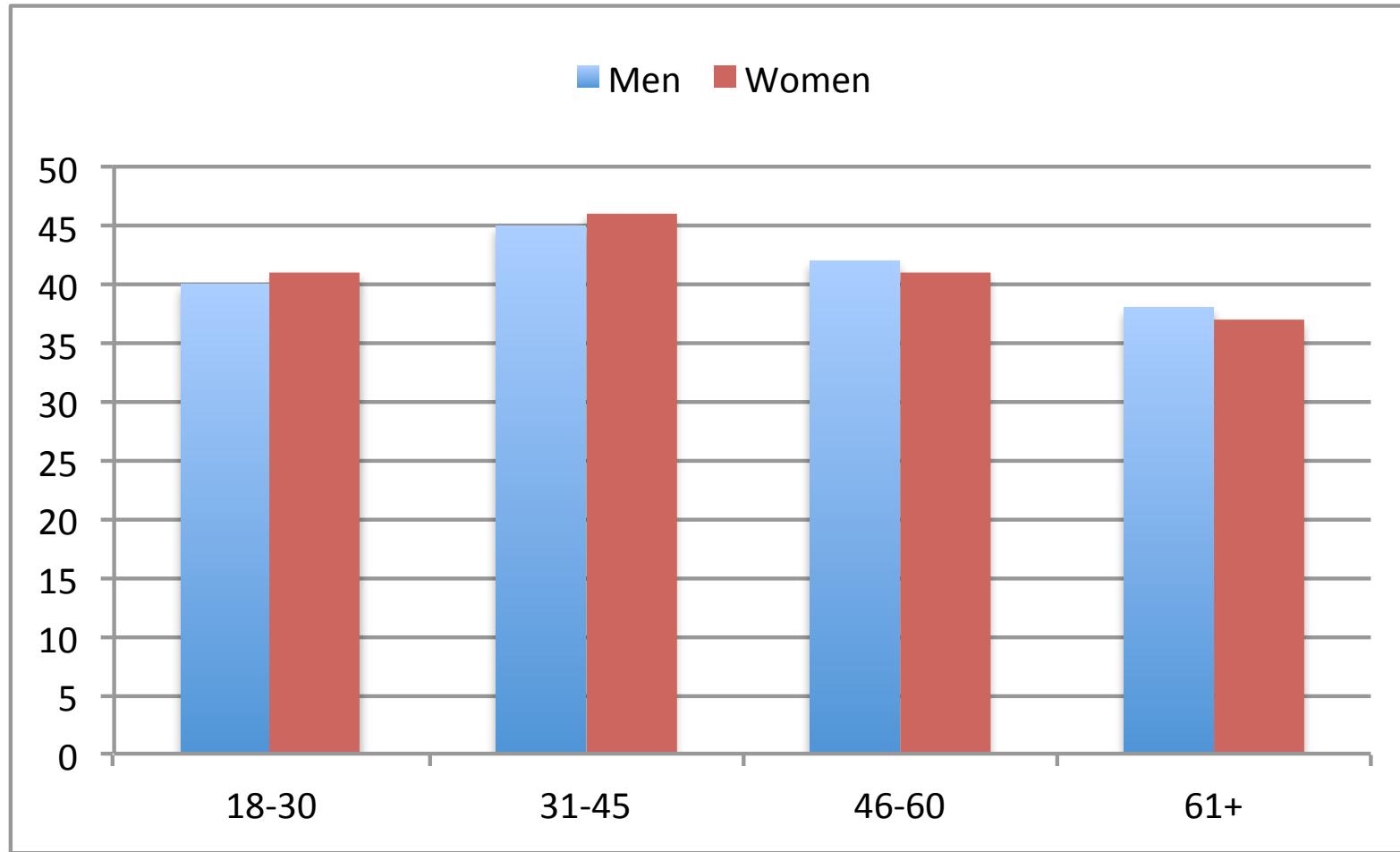
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4. I. Data Collection

4. I Corpus-based Methodology: Data Collection

=> Sociolinguistic Variables II: Gender and Age



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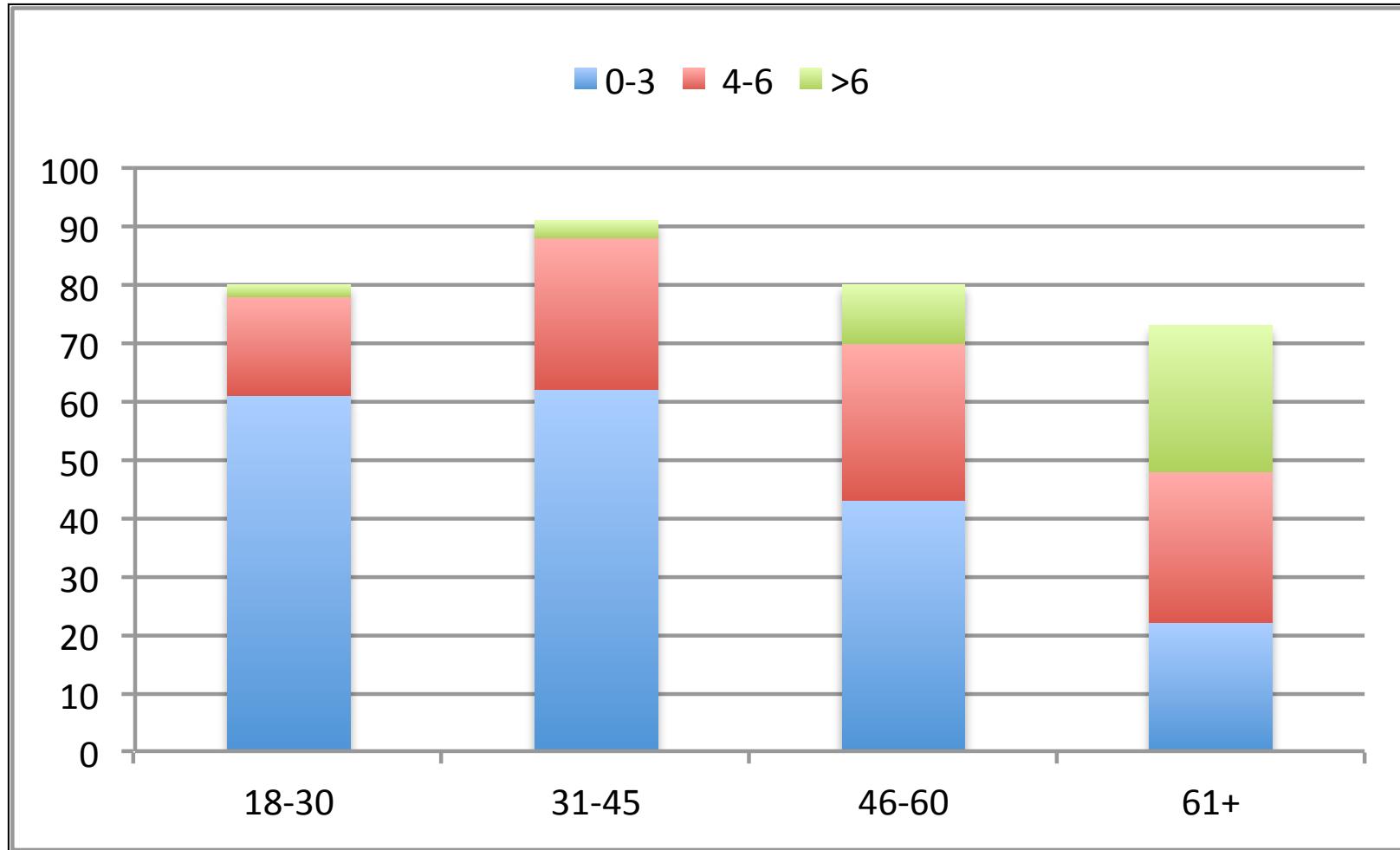


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4. I Corpus-based Methodology: Data Collection

=> Sociolinguistic Variables III: Age of Acquisition



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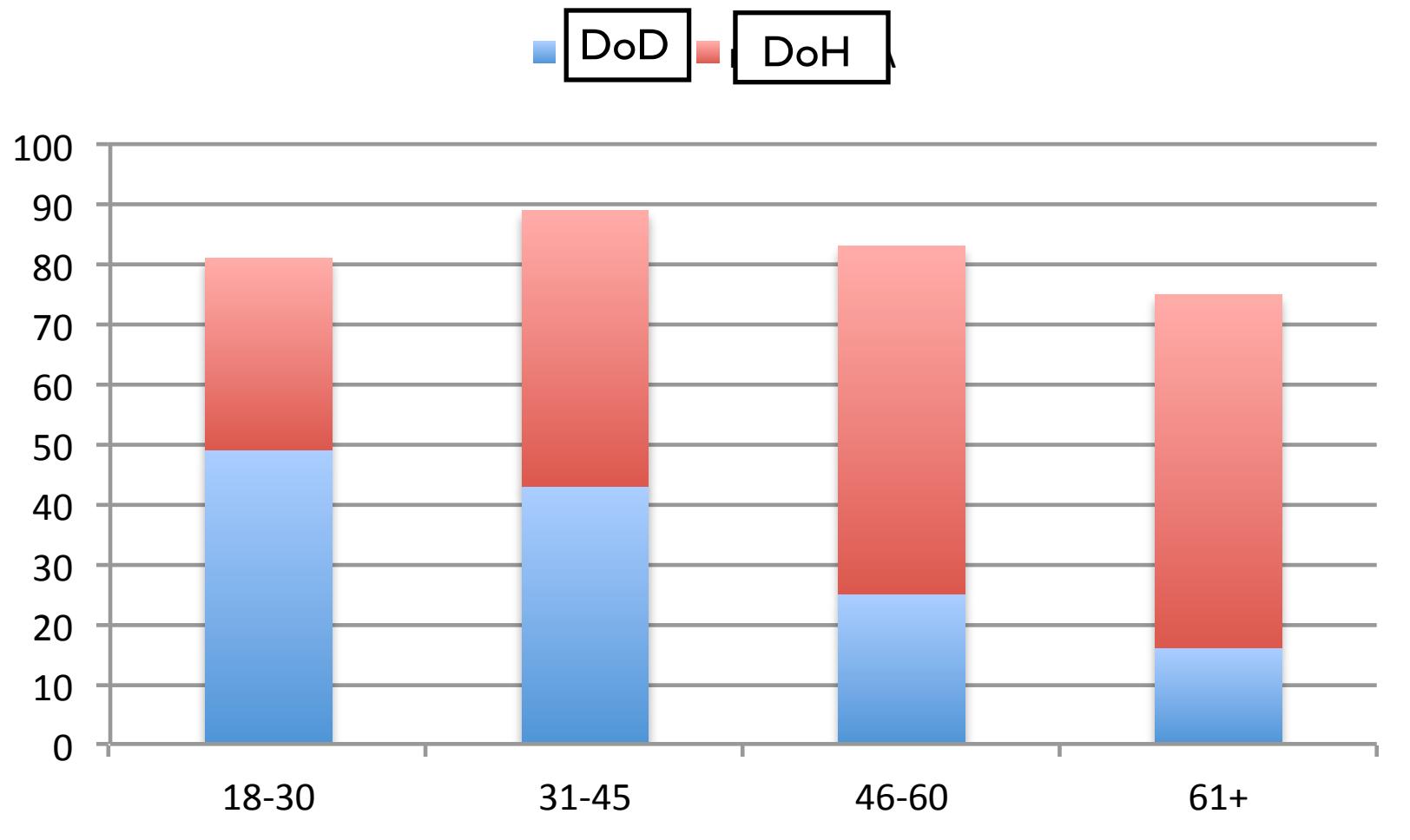


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4. I Corpus-based Methodology: Data Collection

=> Sociolinguistic Variables III: Age of Acquisition



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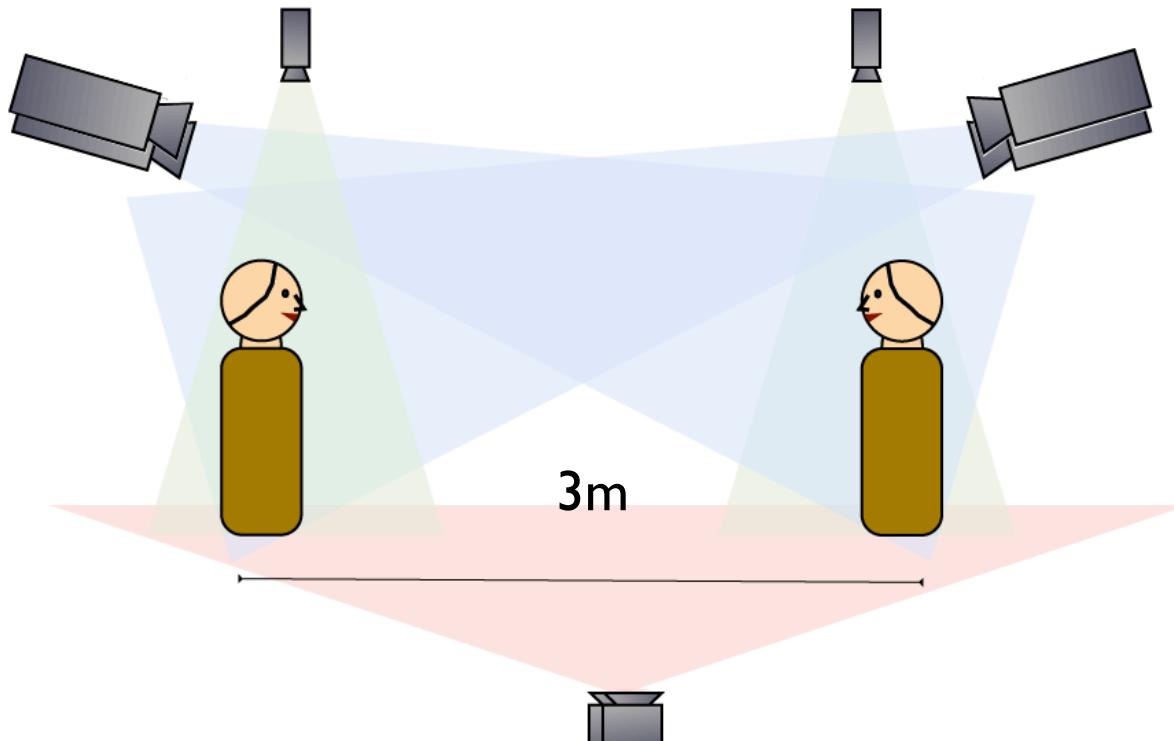
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4. I Corpus-based Methodology: Data Collection

=> Studio Setup I

Studio Setup 2011: 8 Cameras



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4.I Corpus-based Methodology: Data Collection

=> Studio Setup II



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4.I. Data
Collection

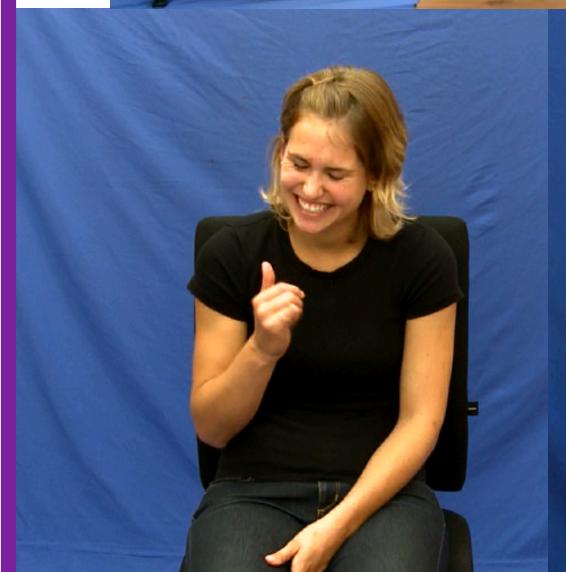
4.I Corpus-based Methodology: Data Collection

=> Studio Setup III

Outcome: DGS Corpus



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DGS-KORPUS

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4.I. Data
Collection

4.1 Corpus-based Methodology: Data Collection

=> Elicitation Procedure I

| Formats | Tasks (examples) | Goal |
|---------------------|--|--|
| ● narration | Jokes (prepared signing) | Deaf cultural heritage |
| ● re-telling | Frog Story (pre-structured signing by fixed order of pictures) | Cross-linguistic research |
| ● argumentation | Discussion on various topics | Emotional output |
| ● isolated signs | Isolated Signs | Regional variations |
| ● description | Description of Procedures | Description of different activities |
| ● explanation | Sign Names | Deaf cultural heritage |
| ● negotiation | Calendar Task | Signs for numbers and days of the week |
| ● free conversation | Free Conversation | Conversation without moderator |
| ● discussion | Warning and Prohibitive Signs | Expressions of negation |



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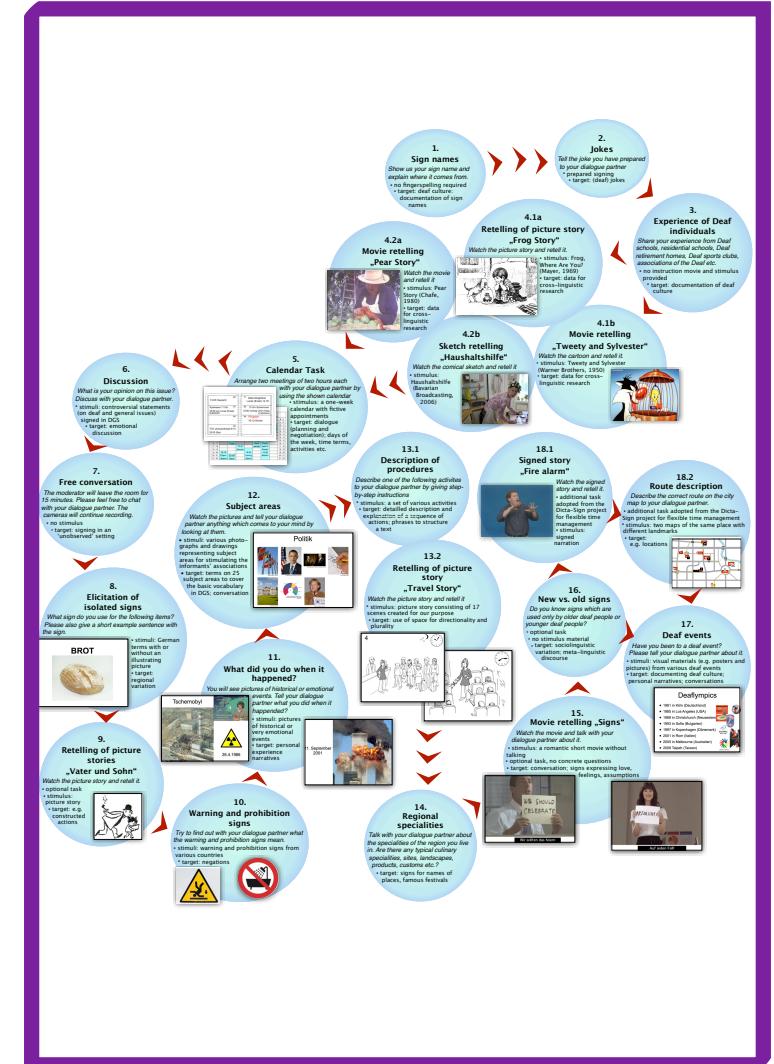
4. I Corpus-based Methodology: Data Collection

=> Elicitation Procedure II

| | |
|--------------------------|----------------------------|
| Name signs | Warning signs |
| Jokes | Regional specialities |
| Experience of Deaf | Subject areas |
| Calendar task | Retelling (Father and son) |
| Story retelling | Movie "Signs" |
| What did you do when...? | Procedures |
| Discussion | Travel story |
| Free conversation | New vs. old signs |
| Isolated signs | Signed story "Fire alarm" |
| No material | Route description |
| Still pictures | Deaf events |
| Picture story | |
| Movies | |
| Objects | |
| Language | |

4. I Corpus-based Methodology: Data Collection

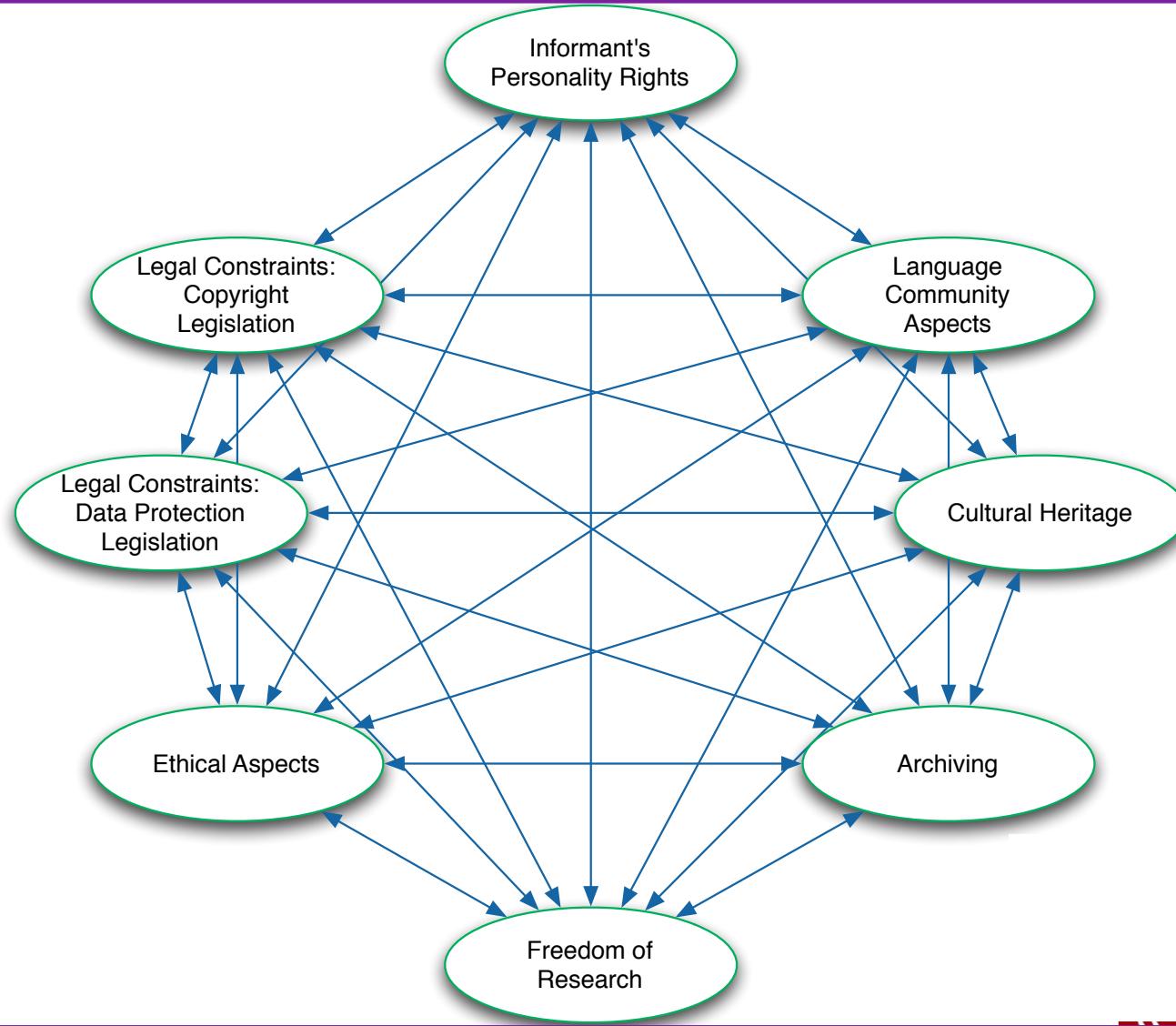
=> Elicitation Procedure I



4. I. Data Collection

4. I Corpus-based Methodology: Data Collection

=> Ethical Issues I



4. I. Data Collection

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4. I Corpus-based Methodology: Data Collection

=> Ethical Issues II



3 pages
Introduction
in German

Purpose of
research

Data collection:
Contact, Meta, Video

Use of data within
the project

Data sharing
options

1.5 pages
Informed Consent
Declaration in
German: Signature

Basic agreement

Sharing options to
be checkmarked



DGS
version



4. I. Data
Collection

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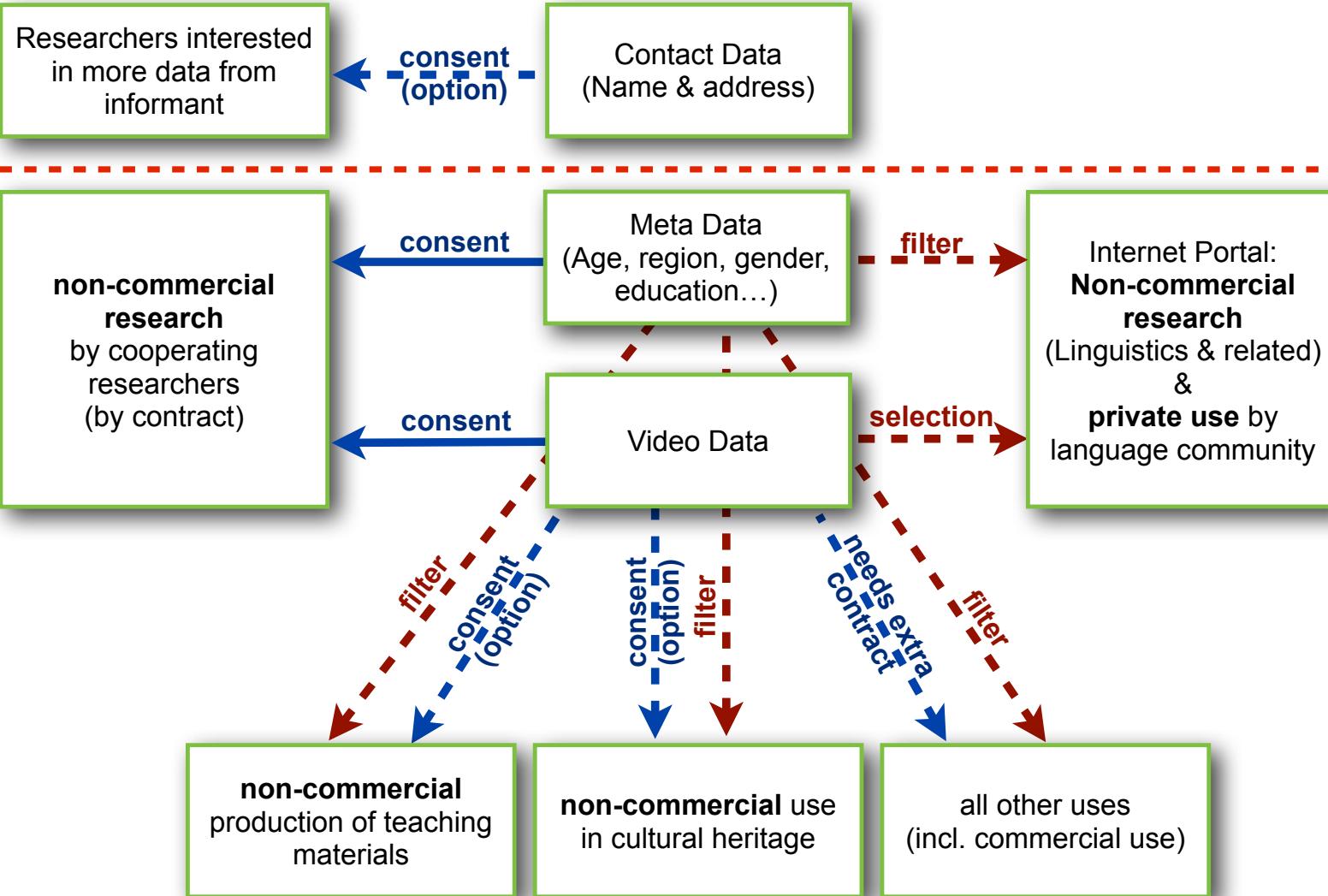


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4.I Corpus-based Methodology: Data Collection

=> Ethical Issues III



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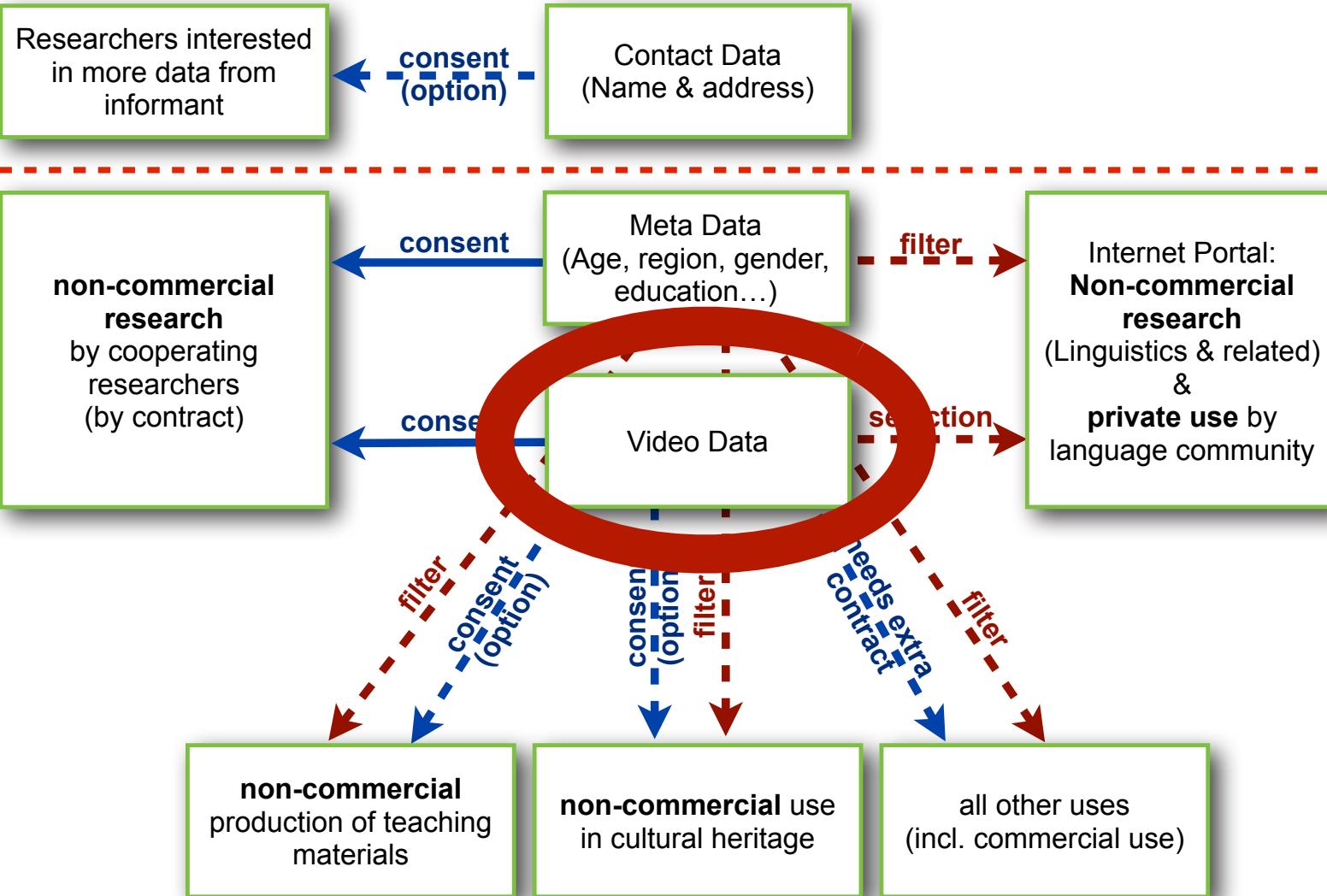


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4.I Corpus-based Methodology: Data Collection

=> Ethical Issues IV



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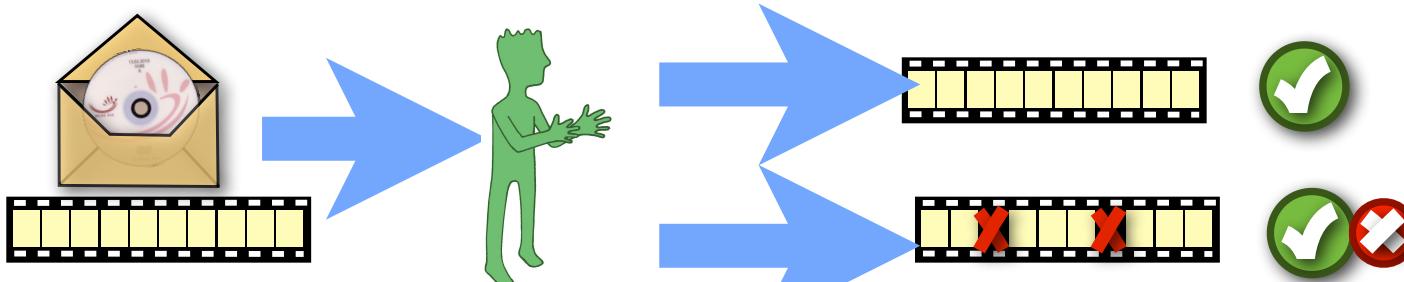


4.I Corpus-based Methodology: Data Collection

=> Ethical Issues IV

Clearance & Exclusions

- complete session is sent to informant (DVD)
- informant gives clearance
- informant may exclude parts of film
 - for publication
 - for all uses including research (→ deletion)



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4.2. Transcription and Annotation I

Translation

- Translation into German, segmentation into utterances

Basic Transcription

- Transcription / annotation carried out by student research assistants
- Supervised and checked by native signers
- Tokenization (segmentation into single signs)
- Lemmatization (token-type matching: identification and tagging of lexical items via glossing), tagging of productive signs and other signs
- Further specifications:
 - Variant, modified and deviant sign forms
 - Mouthings

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4.2. Transcription and Annotation II

Segmentation

- one of the first steps in any sign language transcription work as it is the prerequisite to lemmatisation

Two Possibilities:

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- (i) A sign starts where the preceding one ends (i.e. fluent signing means there are no gaps between signs)
- (ii) Transitional movements between signs do not count as part of either sign. Therefore, usually there are gaps between two signs during which the articulators move from the end of one sign to the beginning of the next.



4.2. Transcription and Annotation II

Segmentation

- prerequisite to lemmatisation

Two Approaches:

(i) A sign starts where the preceding one ends (i.e. fluent signing means there are no gaps between signs)

(ii) Transitional movements between signs do not count as part of either sign. Therefore, usually there are gaps between two signs during which the articulators move from the end of one sign to the beginning of the next.

Empirical Evidence: 50 fps movies versus 500 fps movies

Hanke et al 2012

4.2. Data Annotation



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4.3. Transcription and Annotation III

Detailed Transcription

- Approximately 50% of the basic transcriptions will be transcribed in more details
- Differentiation of phonological variants
- Use of space
- Coding of contextual meaning
- (Morpho-)syntactic properties
- Contextual information
- Mouth gesture, (lexical) facial expressions
- Sub-sentence phrase structure

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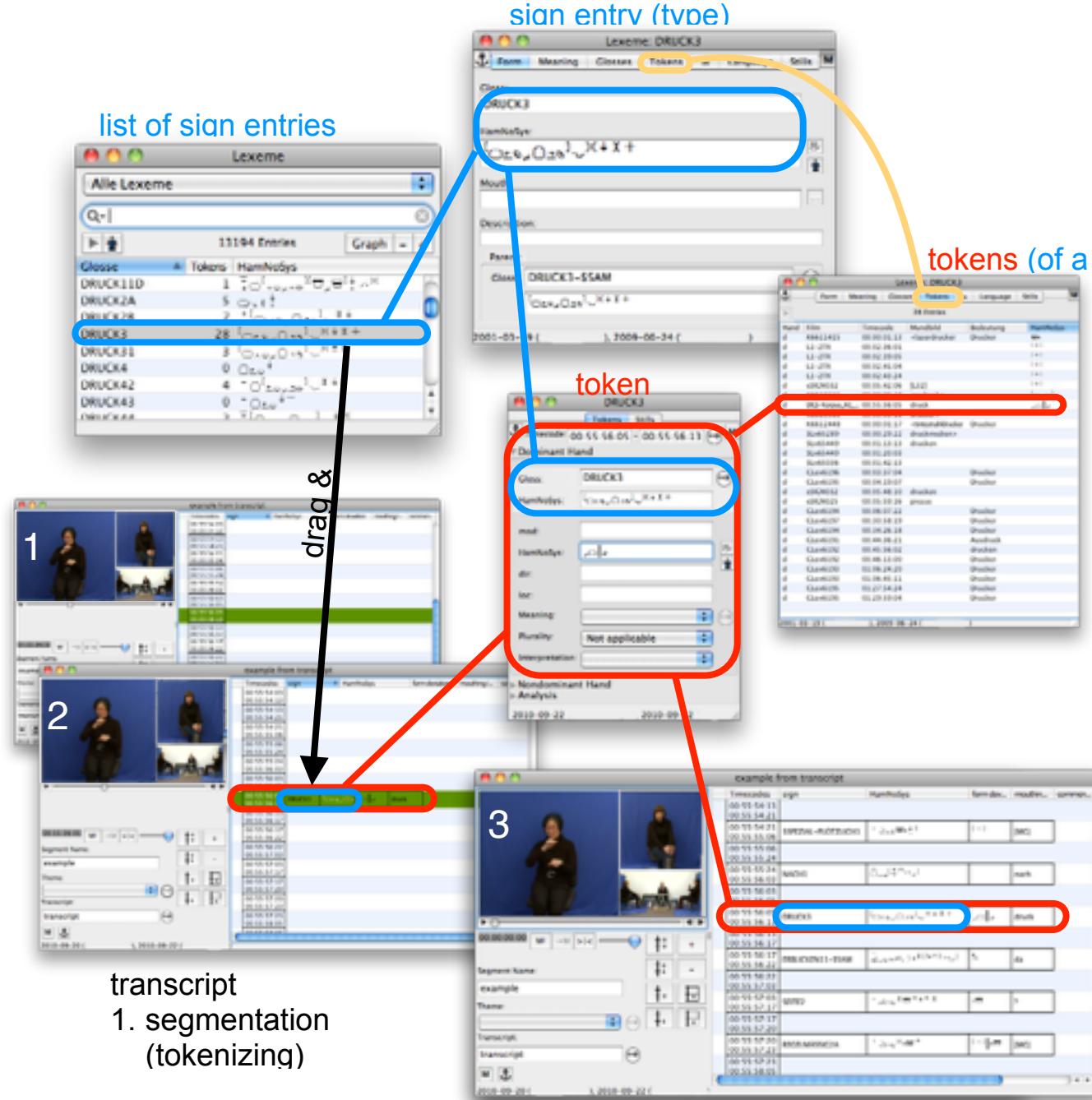
4.3. Transcription and Annotation IV

The iLex Environment

- Transcription and annotation tool
- Works with several synchronized video streams allowing the user to switch between different perspectives
- Integrated lexical database supports token-type-matching
- Metadata integrated into the database
- Multi-user approach
- Analyses via SQL statements
- Support of lexicographic workflow (work in progress)
- Support of quality assurance (work in progress)
- Export functions to ELAN, Quicktime with subtitles, HTML etc.
- Integrates video processing

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4.2. Data Annotation

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4.3. Transcription and Annotation V

Token-type matching

transcript

type list

drag&drop

ilex://types.id=6889; sub-type's name = JA1A (yes)

Lemma revision

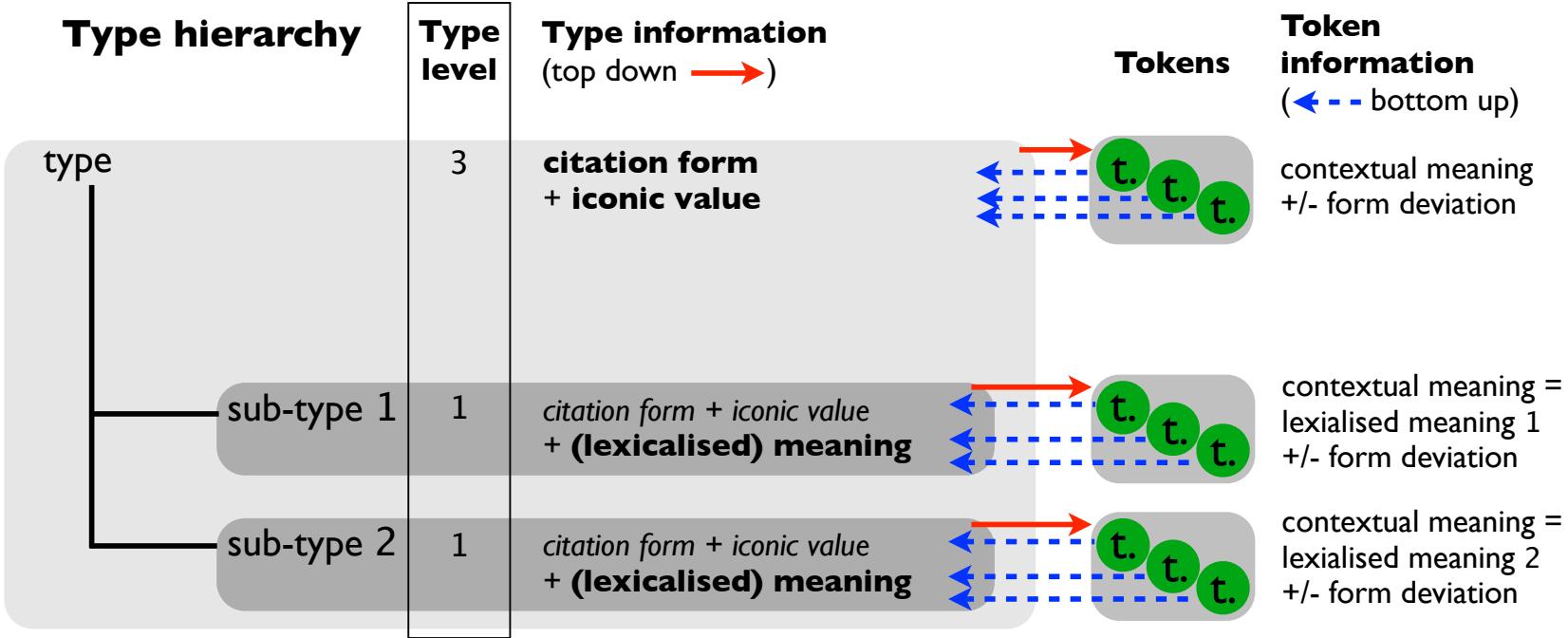
| Lexeme: JA1A | | | | | |
|--------------|----------|-------------|----------|-----------|----------|
| | Form | Meaning | Glosses | Tokens | Lang |
| 192 Entries | | | | | |
| Hand | Film | Timecode | Mundbild | Bedeutung | HamNoSys |
| d | eSIGN012 | 00:02:28:03 | ja | " | |
| d | eSIGN016 | 00:06:10:01 | ja | " | |
| d | eSIGN025 | 00:02:42:15 | ja | " | |
| d | eSIGN032 | 00:05:05:10 | ja | " | |
| d | GLx19702 | 00:03:46:24 | | | ∅∅ |
| d | GLx19802 | 00:01:09:13 | ja | : | •• |
| d | F1_L0202 | 00:00:00:09 | | + | (n) |
| d | F1_L0207 | 00:00:00:08 | | + | (n) |
| d | F1_L0508 | 00:00:00:14 | | + | (n) |

deviant token

Konrad et al 2012



4.3. Transcription and Annotation V



Konrad et al 2012



4.2. Data
Annotation

4.3. Transcription and Annotation VII

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Data Validation

- Intercoder's reliability check
- Feedback from Sign Language Users (see Matthes et al to be presented at TISLR 11 in London)



4.2. Data Annotation

International Conference on Sign Linguistics
and Deaf Education in Asia
30 Jan - 2 Feb 2013



5. Corpus-based Analyses: Multiple Implications

5.1. Color Signs - A Preliminary Study I (Langer 2012)

Data:

- 156 informants (from 12 regions, 90 counties)

Content:

- task: elicitation of isolated signs for colors

Size:

- 2052 tokens

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5. Analysis

Generating Distributional Maps

could be produced directly from the data in the database (e.g. iLex) on demand

Langer 2012

Annotation / Lemmatization

iLex

**Spot annotations*:
Segmentation & Lemmatization**

tokens ↔ **types (variants)**

**metadata on informants:
e.g. place of living (county)**

*spot annotations by:
Nele Groß,
Ilona Hofmann,
Lutz König,
Gabriele Langer

SQL-query: distribution of tokens of a certain type

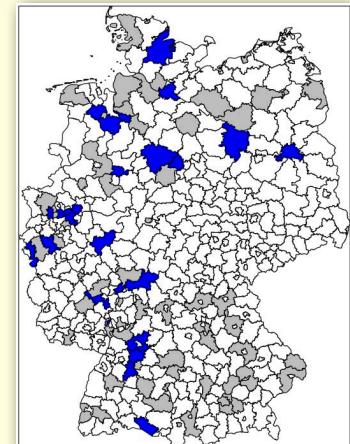
```
SQL-Statement:
SELECT DISTINCT kcode.value::integer, COUNT(tokens.id)
FROM tokens
JOIN tags ON tags.token_dom=tokens.id OR
tags.token_nondom=tokens.id
LEFT OUTER JOIN types qt ON tokens.type=qt.id AND qt.level=0
LEFT OUTER JOIN types l ON tokens.type=l.id AND l.level=1
JOIN tiers ON tokens.tier=tiers.id
JOIN transcripts ON tiers.transcript=transcripts.id
JOIN movies ON transcripts.movie=movies.id AND
movies.project=166
JOIN participations ON tiers.participation=participations.id
JOIN informants ON participations.informant=informants.id
JOIN metadata_descriptions kcode ON
kcode.informant=informants.id AND kcode.kind=366
WHERE tokens.id IN
(SELECT tokens.id FROM tokens
JOIN tags ON tags.token_dom=tokens.id OR
tags.token_nondom=tokens.id
JOIN types qt ON tokens.type=qt.id
JOIN types l ON qt.parent=types.id AND qt.level=0 AND
types.id=l.id)
UNION
SELECT tokens.id FROM tokens
```

| Kreis | Tokens |
|-------|--------|
| 11 | 2 |
| 72 | 1 |
| 76 | 1 |
| 79 | 1 |
| 87 | 1 |
| 190 | 2 |
| 203 | 1 |
| 209 | 1 |
| 210 | 3 |
| 214 | 1 |
| 217 | 2 |
| 254 | 1 |
| 270 | 1 |
| 278 | 1 |
| 286 | 1 |
| 287 | 1 |
| 288 | 1 |
| 295 | 1 |
| 300 | 1 |
| 306 | 1 |
| 308 | 1 |
| 320 | 1 |
| 323 | 1 |
| 342 | 1 |
| 350 | 1 |
| 396 | 1 |
| 400 | 2 |
| 408 | 1 |

feeding data into R

```
> library(maps)
> library(sp)
> con <- url("http://gadm.org/data/rda/DEU_adm3.RData")
> print(load(con))
[1] "gadm"
> close(con)
> ...
> spplot(dd, "NAME_3", col.regions=col,
colorkey=F)
```

result: map



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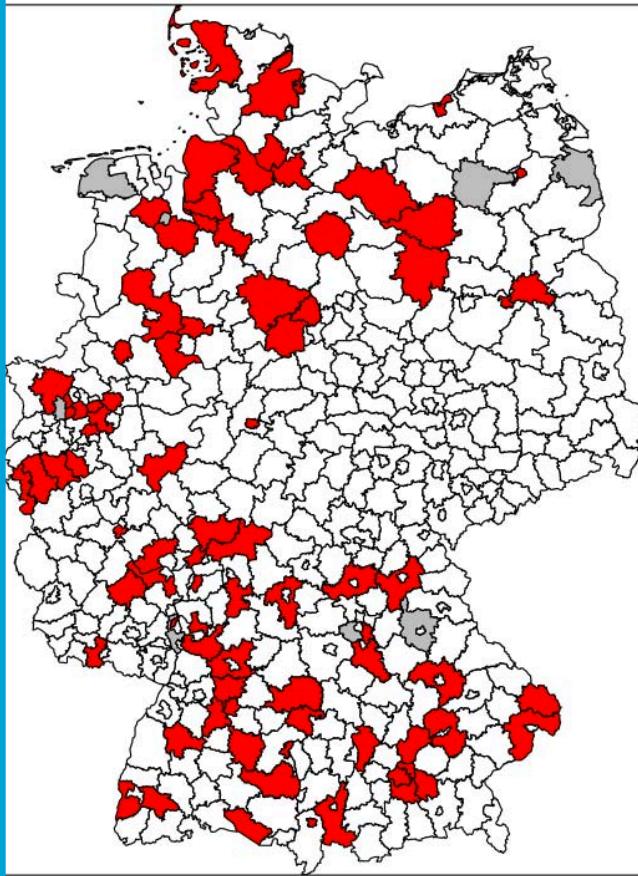


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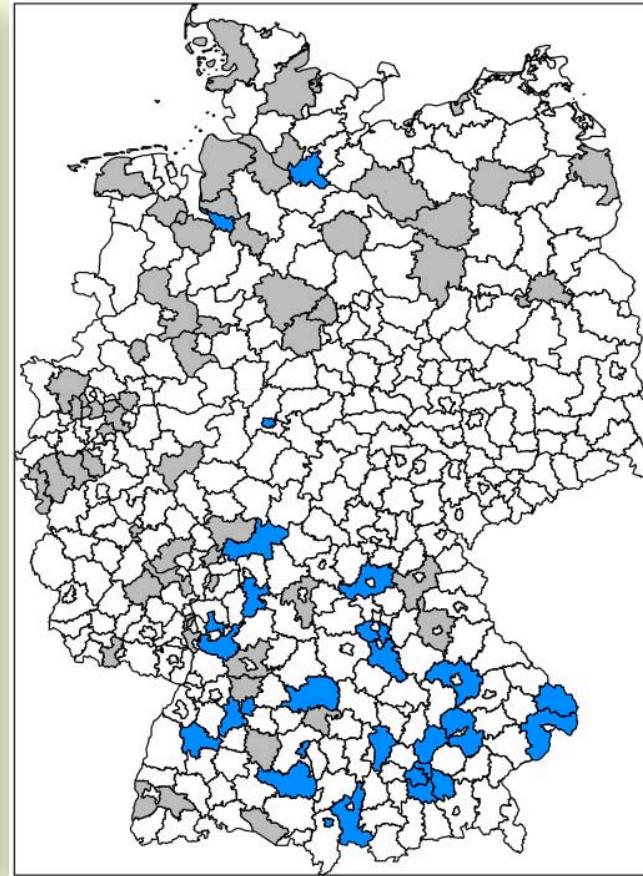


5. Analysis

display of one variant



Map 1:
RED1 $\text{d} \sim \text{o} \text{u}^{\wedge} \text{(} \rightarrow \text{)} \text{d} \text{ } \chi^+$



Map 2:
BLUE3 $\text{d} \text{r} \text{o}^{\wedge} \text{[} \text{x} \text{ } \text{u} \text{ } \text{r} \text{]} \text{ }$

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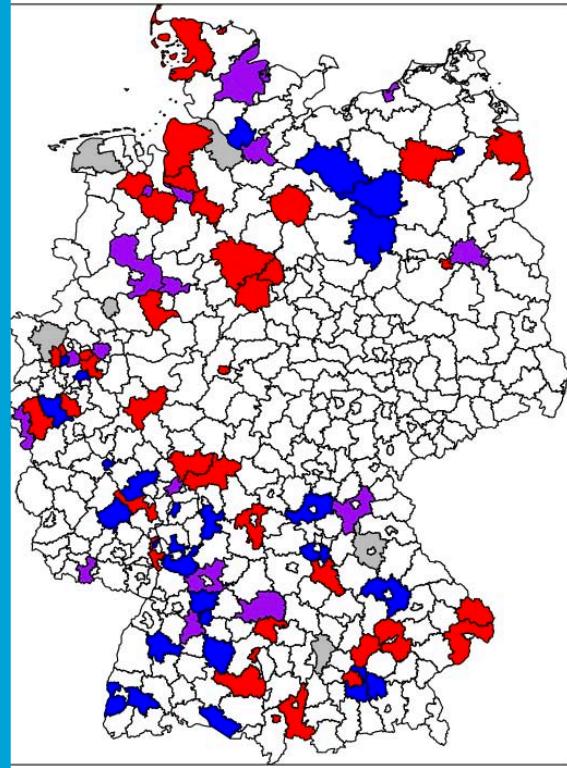
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Langer 2012

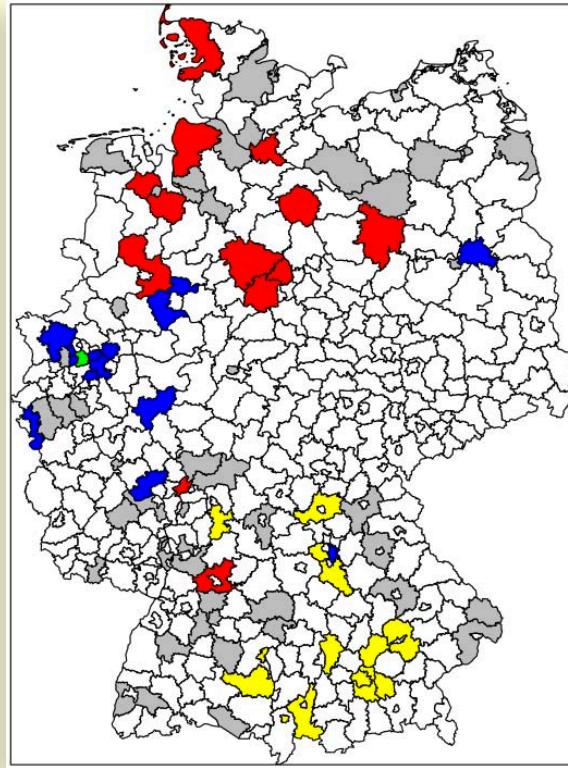
display of two or three variants

(overlapping areas of use: mixed colors)



Map 3:

- █ BLACK1
- █ BLACK2
- █ BLACK1 and BLACK2



Map 4:

- █ GREEN3
- █ GREEN2
- █ GREEN9A
- █ GREEN2 and GREEN9A

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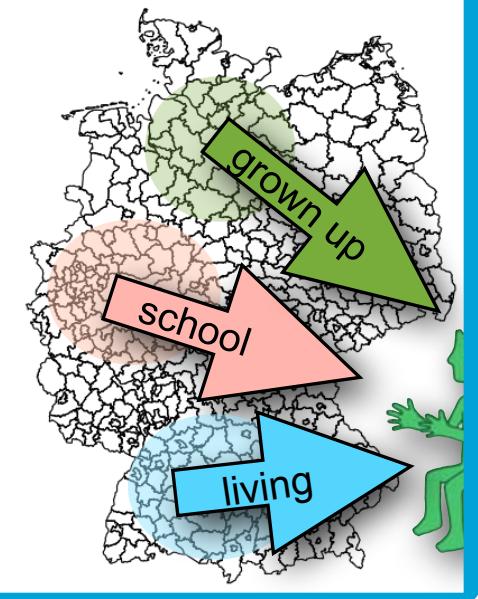
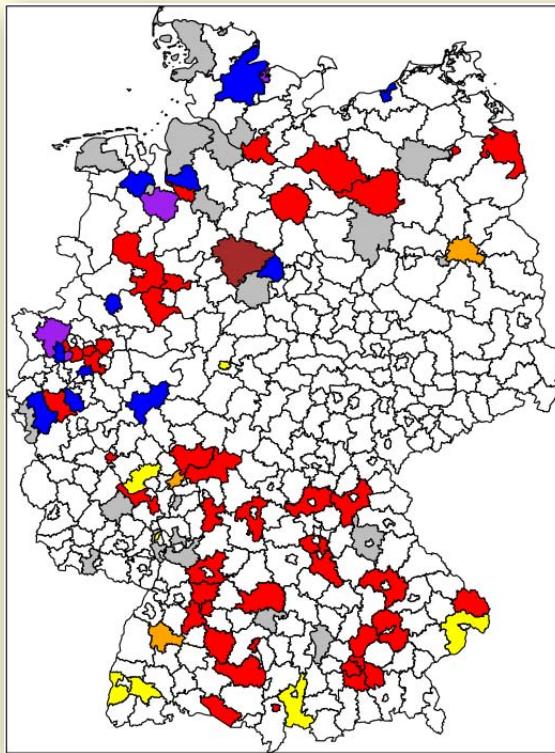
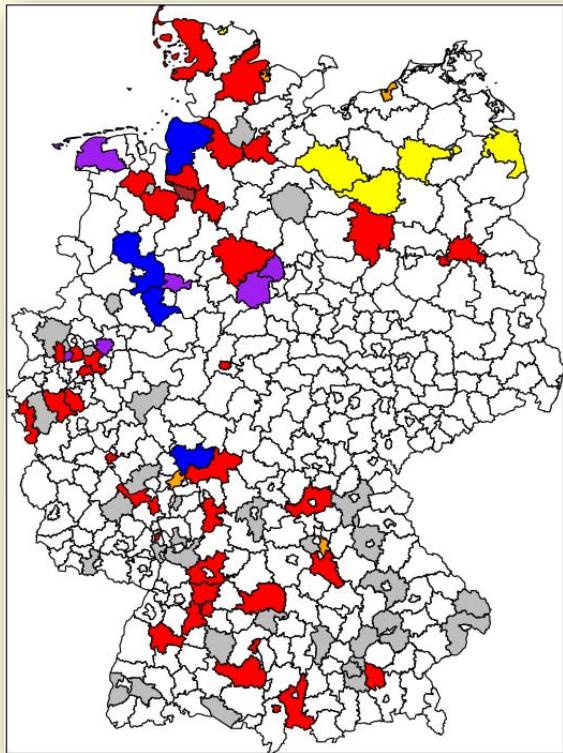
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Langer 2012

display of two or three variants

(overlapping areas of use: mixed colors)

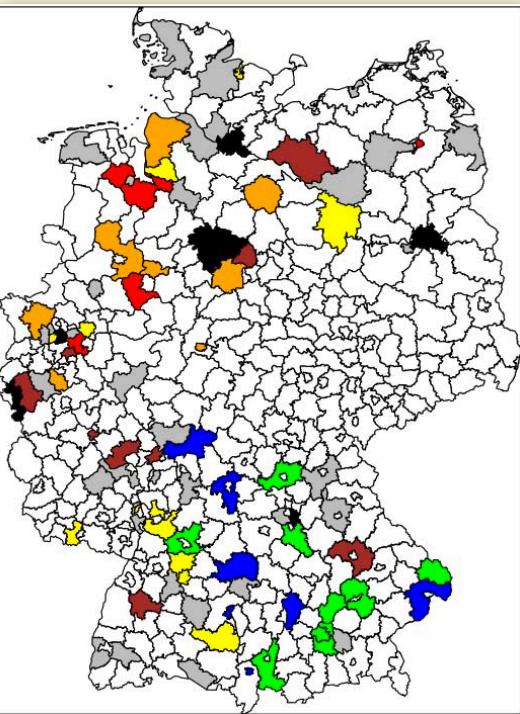


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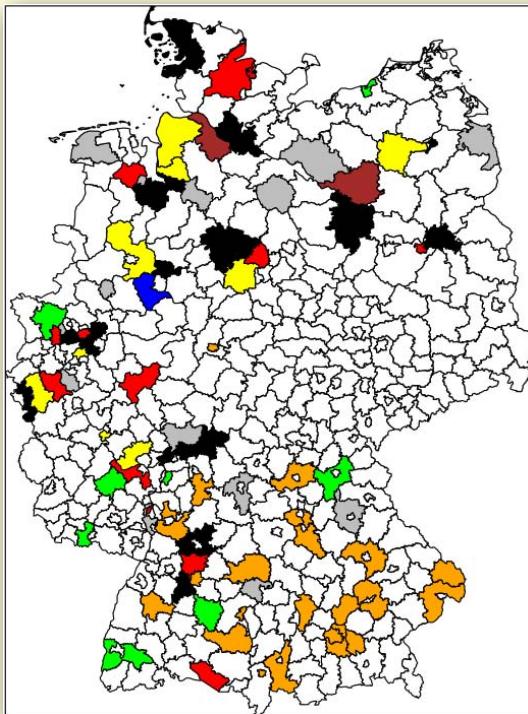


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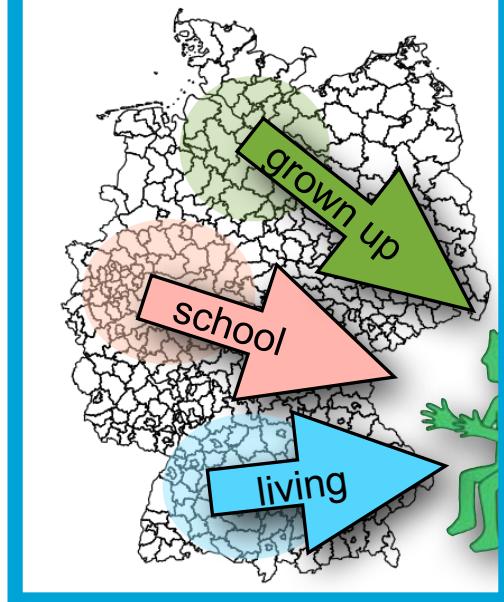
display of six variants



Map 5:
BROWN2A $\ddot{\text{a}} \text{ } \text{ } \text{ } \text{ } \text{ }$
BROWN029 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BROWN7 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ } \text{ } \text{ } \text{ }$
BROWN8 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ } \text{ } \text{ }$
BROWN9 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BROWN4 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
(overlapping areas of use)



Map 6:
BLUE1 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BLUE3 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BLUE2 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BLUE4 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BLUE6 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
BLUE8 $\text{d} \text{ } \text{r} \text{ } \text{a} \text{ } \text{h} \text{ } \text{ }$
(overlapping areas of use)



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5. Corpus-based Analyses: Multiple Implications

5.2. Name Signs

- Physical Appearance
- Individual Habits (Behavior)
- Meaning of First and/or Family Name
- (phonemically-based) fingerspelling

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Question: What kind of sociolinguistic variables plays a role?

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5. Analysis

5.3. Verb Agreement

- Diachronic change (regular verb and PAM)
- Argument structure (animacy constraint)

5.4. Aspectual Modulations

- Diachronic change
- Distribution of aspectual morphemes including FINISH

5.5. Language Contact

- Language contact between Hungarian SL and Hungarian (Rácz 2013)

5.6. Relative Clause Constructions

- RCC constructions in Turkish Sign Language (Kubus 2010, 2011, 2012 and to appear)

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5. Analysis

5.7. Ethnographic Analyses (Deaf Studies)

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W **Wissen**

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- Organisation
- Sprache
- Kultur
- Bildung
- Alltag
- Geschichten
- Sonstiges

Aktuelles

Weihnachtsgeschichte: "SCHNEE" (Gunter Putrich-Reignard, 1994)

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07.12.2012: Trekking in Nepal, 2010 (Andre Sailer, 2011)

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5. Analysis

Structure of the Talk

I. Outline

2. Importance of Data-Driven and Corpus-based Work in Contemporary Sign Language Research

3. Two Goals of DGS Corpus Project: An Overview

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6. Conclusion

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