Methods and strategies for a multimodal corpus analysis:

Using ELAN for sound scientific research

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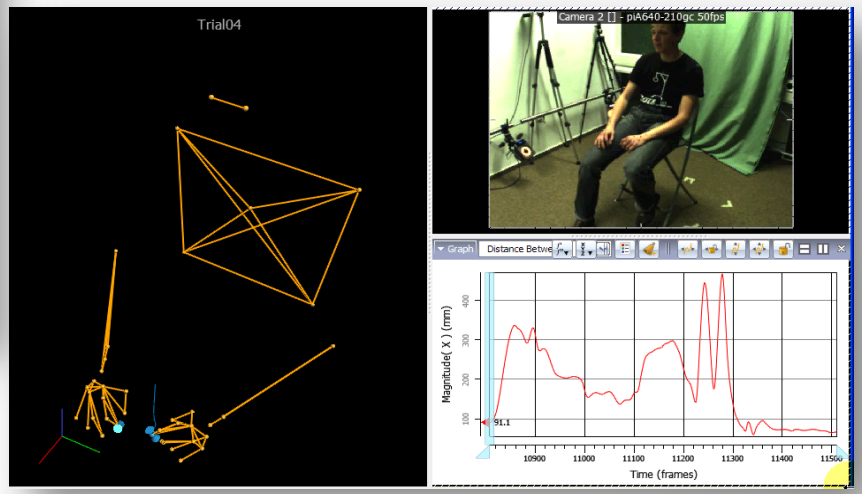
Who are we?

natural media
& engineering

- Natural Media & Engineering (RWTH Aachen University)
  - Spoken and signed languages, gesture, posture, gaze, etc.
  - Cognitive, semiotic, clinical, applied perspectives
  - Natural Media Lab: Motion Capture (MoCap) system



What will we do today?

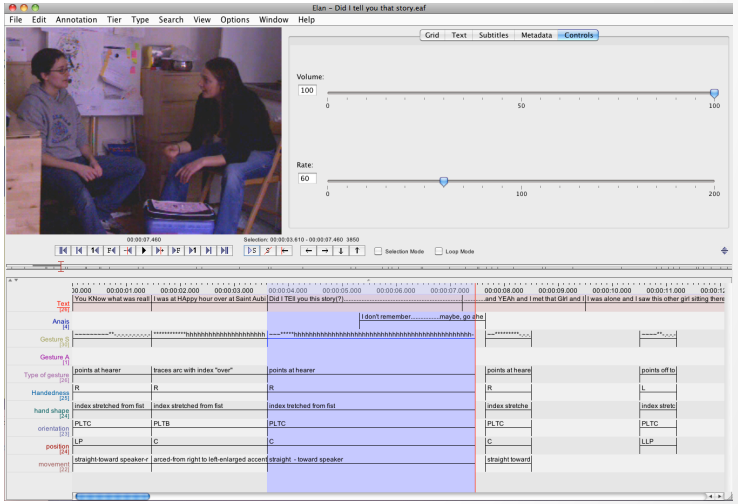
- Talk about our own experience as multimodal communication researchers
- Introduce ELAN as an annotation tool for multimodal corpora
- Discuss various research carried out using ELAN
  - Anthropology
  - Neurocognition
  - Linguistics
  - Film analysis, etc.
- Show how to import clips, create tiers, analyse videos, enter annotations in ELAN
- Using Controlled Vocabularies and Searcher in ELAN
- Present *one* way of working with multimodal data
  - Lead a hands-on annotation of a video clip using ELAN

What *won't* we do?

- Show more advanced operations of ELAN:
  - Merging transcriptions
  - Inter-rater reliability and advanced statistical operations
- Discuss recent and future developments of ELAN
  - see Han Sloetjes' presentation tomorrow
- Provide *the* way of annotating a multimedia corpus

What is ELAN?

- EUDICO (European Distributed Corpus) linguistic annotator
  - An annotation is “a sentence, word or gloss, a comment, translation or a description of any feature observed in the media.”
- Developed at the Max Planck Institute
- http://www.lat-mpi.eu/tools/elan/
  - Download software, demo, and manual
- Purpose: Annotating, analysing and documenting media corpora



Collecting your multimodal data

- Hardware issues
  - Digital camera (Canon HG10)
  - Audio input/output: Mics, headphones, extension cords
  - Tripods (small and large)
  - Spare batteries, etc.
- Set-up issues
  - Camera angle, lighting, “split-screen”, “split-mic”, trial & error
- Post-processing and keeping your data safe
  - File compression (AVCHD → AVI with VirtualDub Mod, Avidemux)
  - Data segments: Cropping video (see above), Slow-playback and screen shots (GOM Player) – but also ELAN!
  - Anonymity issues (blurring face, masking voice), security issues (data encryption; password safe external hard drive), backup

Personal experience with multimodal empirical research

- The need to systematize *a lot* of multimodal data
- The ability to quickly annotate and find relevant parts
- The need to easily export these parts for research presentations, papers, etc.
- Qualitative research with quantitative data

ELAN: a tool, not a wizard

ELAN is a powerful tool if you

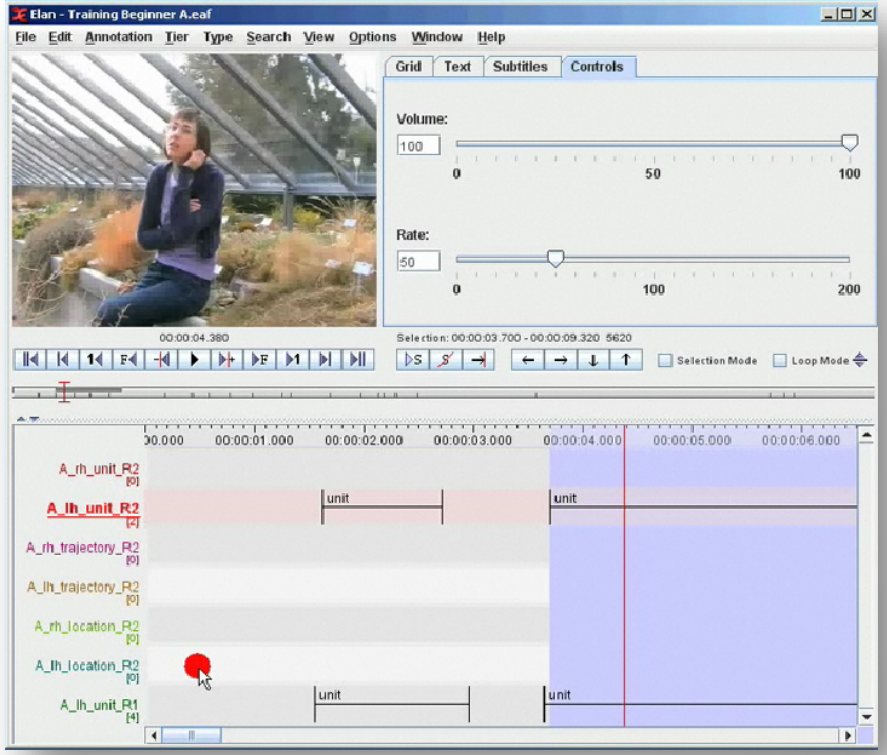
- Define your research questions
- Decide what will be relevant
- Decide what will not be relevant (!)
- Predefine your classification (tiers) and class members (types)
  - What will you do if there can be two categories?
- Test your categories

Examples of research carried out with ELAN

- Linguistic Anthropology
- Neurocognition
- Linguistics
  - Gestures for themselves
  - From gesture to speech
  - From speech to gesture
- Other quick examples
  - Cognitive linguistic film analysis
  - Ethnography of factory communication
  - Dance and therapy

NeuroGes-ELAN
(Lausberg & Sloetjes 2009, 2010) (1/2)

- "Grounded on empirical neuropsychological and psychological studies, the theoretical assumption behind NEUROGES is that its main kinetic and functional movement categories are differentially associated with specific cognitive, emotional, and interactive functions."



NeuroGes-ELAN
(Lausberg & Sloetjes 2009)

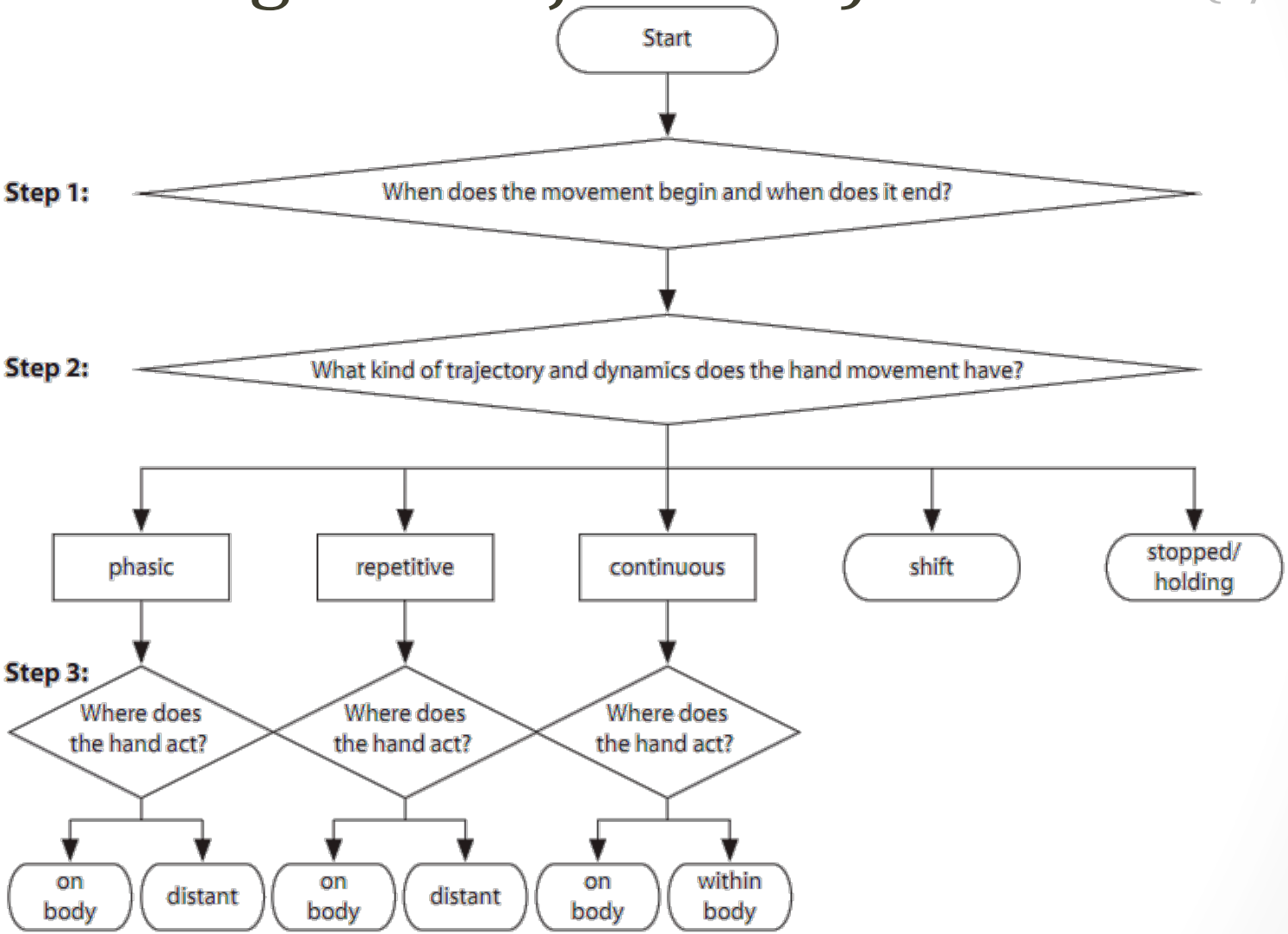
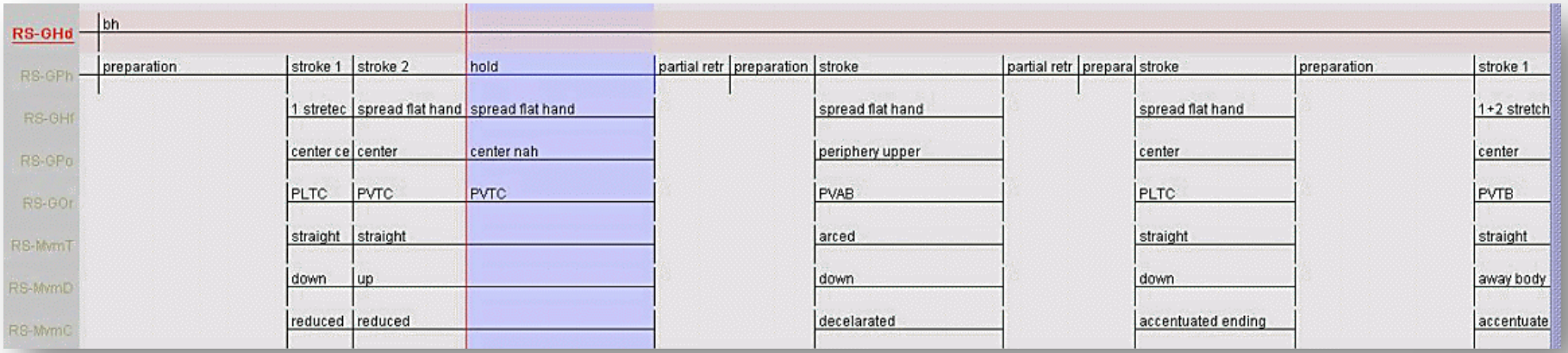


Figure 1. Algorithm for kinetic right-/left-hand coding (Module I).

Gestures for themselves

(1/2)

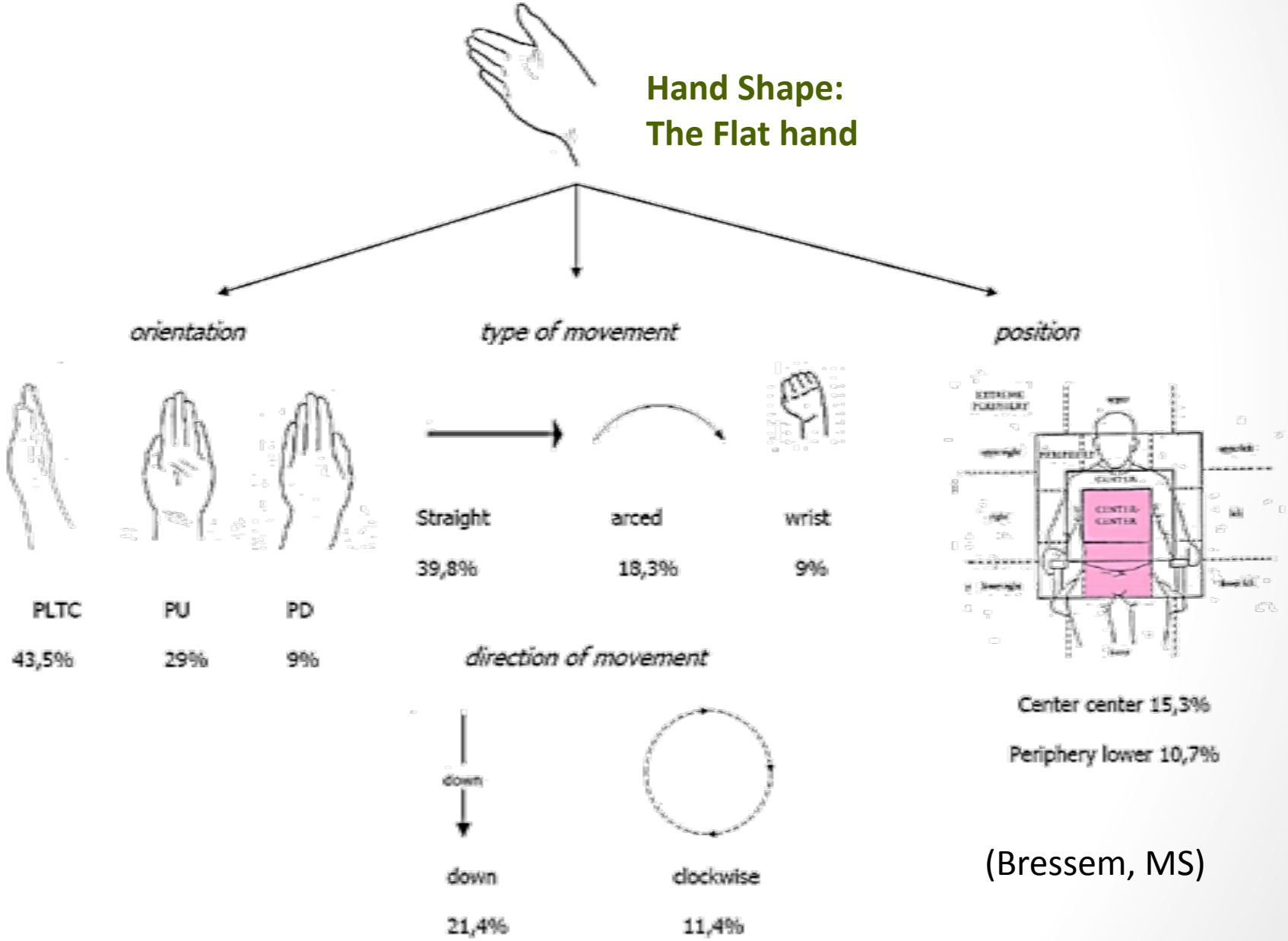
- Bressem (Manuscript)
- Recurrent form-features in coverbal gesture
- Two conversations, 30 min. each, 623 gestures



(Bressem, MS)

Gestures for themselves

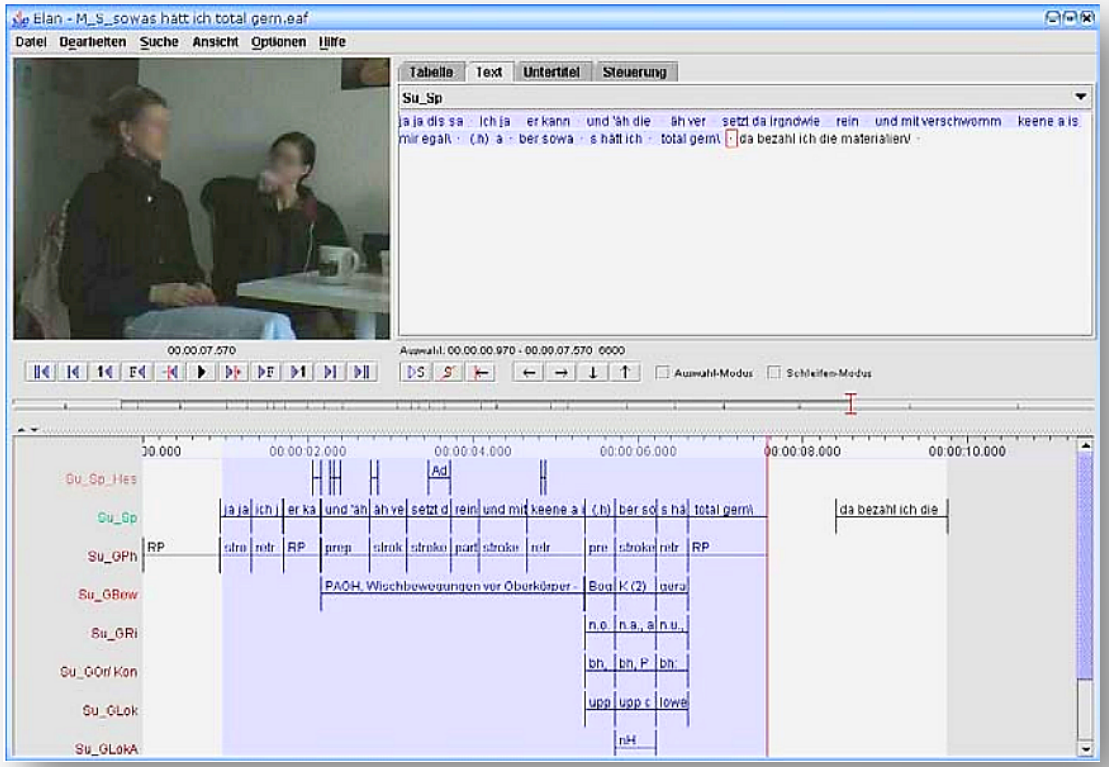
(2/2)



(Bressem, MS)

From gesture to speech (1/2)

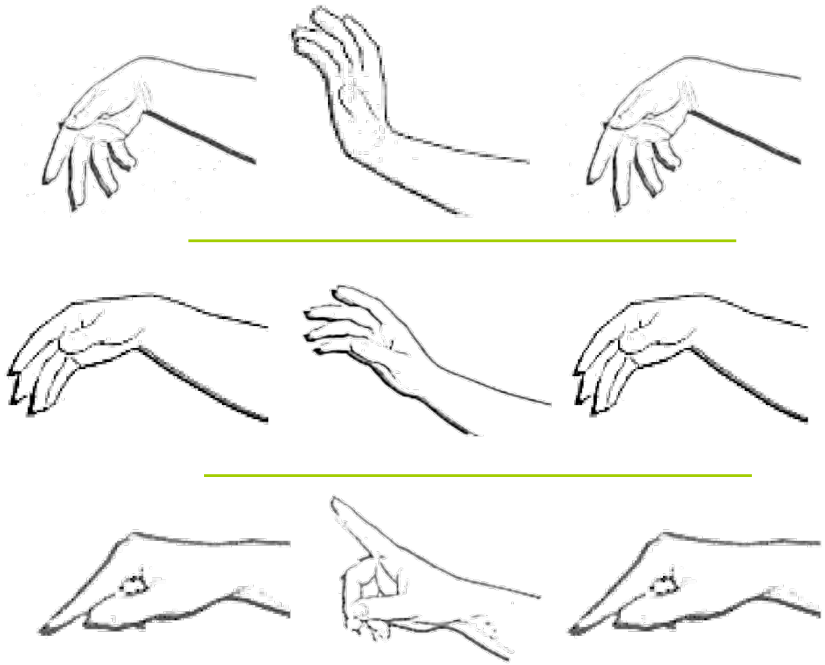
- The “cyclic” gesture (Ladewig, 2007): 57 tokens
- Four main contexts: word searches, descriptions, requests, lists
- Core of form features
  - Circular motion
  - Away from body
  - Hand *in situ*

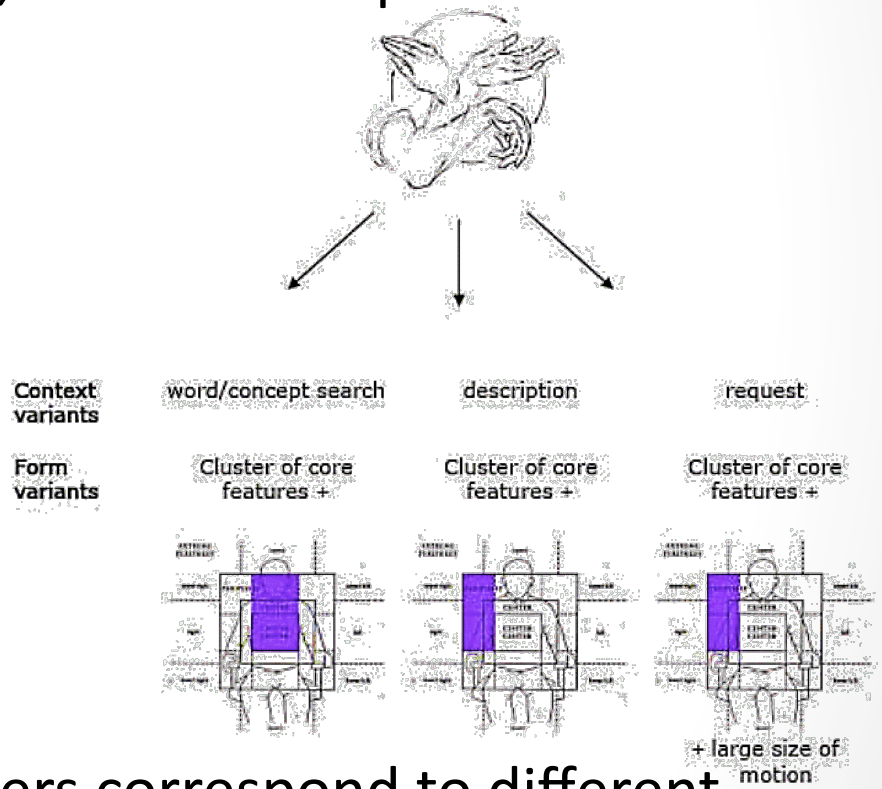


From gesture to speech (2/2)

Additional features

- Hand shapes, sizes of motion, locations in space





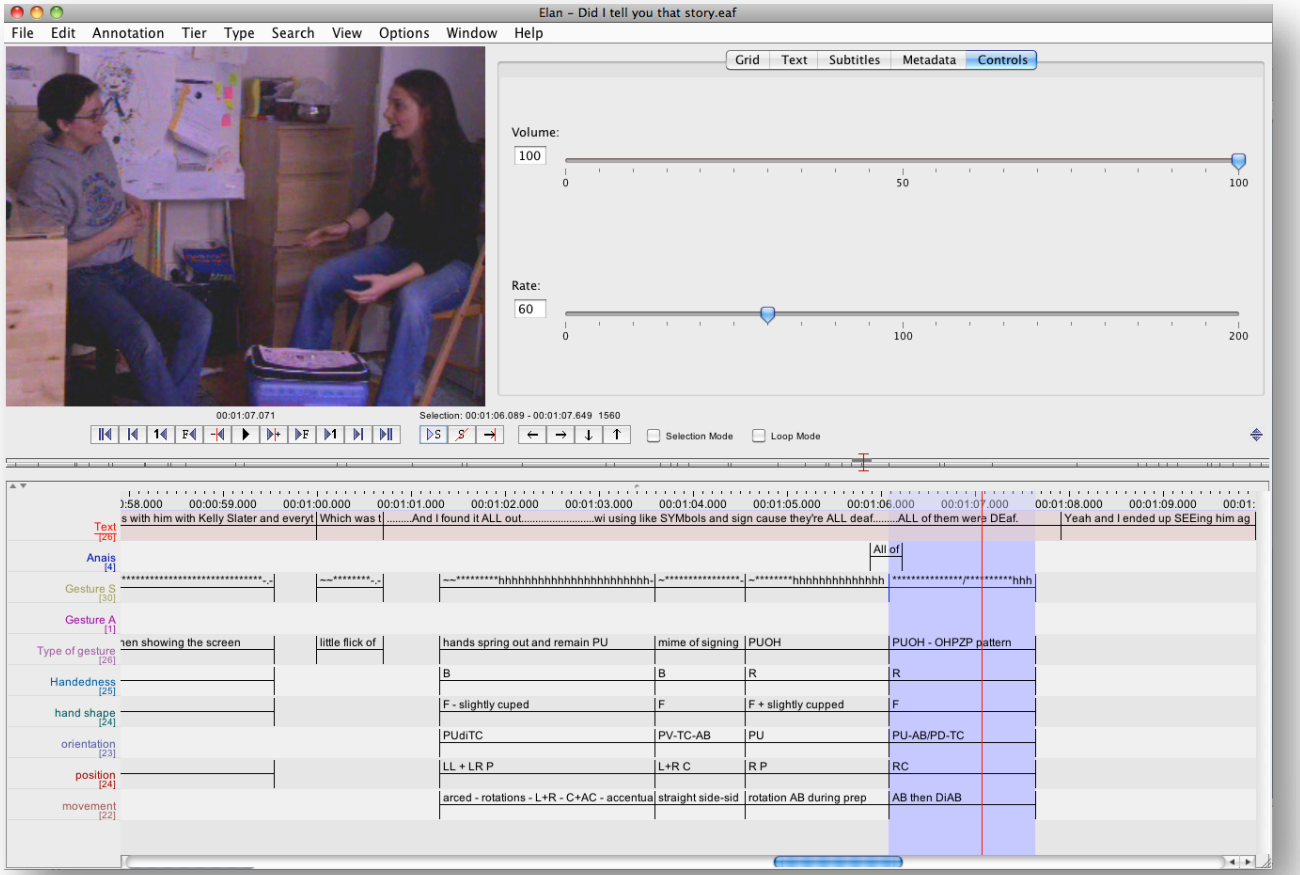
- The different formal parameters correspond to different contexts of use

(Ladewig, 2007)

From speech to gesture

(1/2)

- Gestural forms associated with negation (Harrison, 2009)
- 12-hour corpus with over 30 speakers in ELAN



From speech to gesture

(2/2)

- Results: Harrison (2009)
- 9 different gestural forms
- Multimodal syntax of negation (Harrison 2010)

I doNT have to pay for that night

/----**********-.-.-.-.-.-.-.-./

Other examples of research using ELAN

Film analysis

- Developing ELAN templates for cognitive linguistic film analysis (Tag et al., in prep)
- Tiers for different 'filmic expressional movements': Camera, Sound design, Gesture, Facial expression

Factory communication

- Workplace setting
- How communication flows around shopfloors (Harrison in prep.)

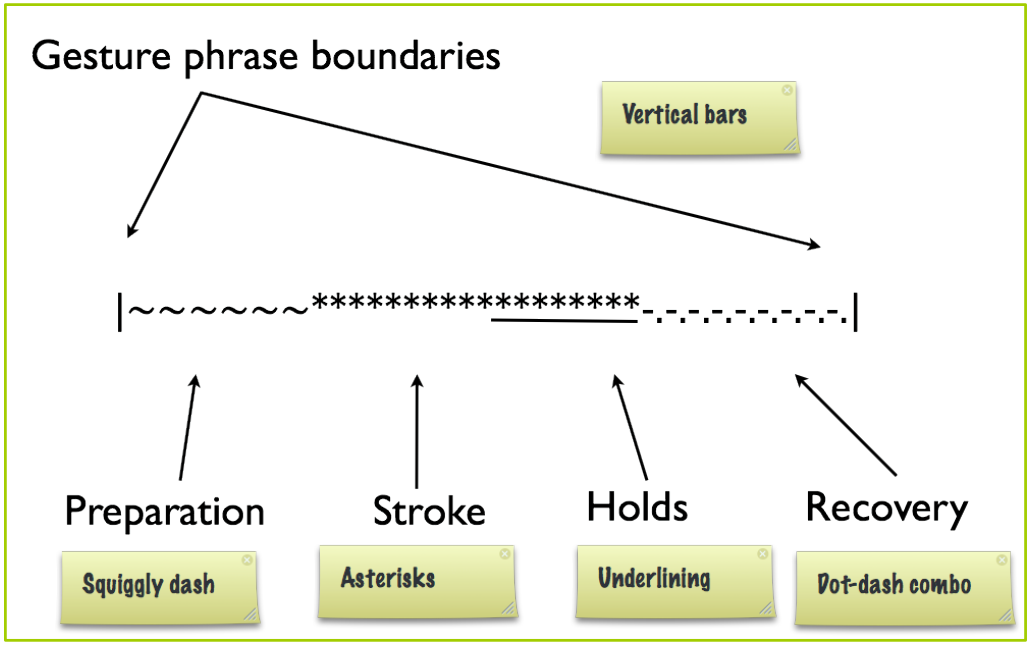
Dance and therapy

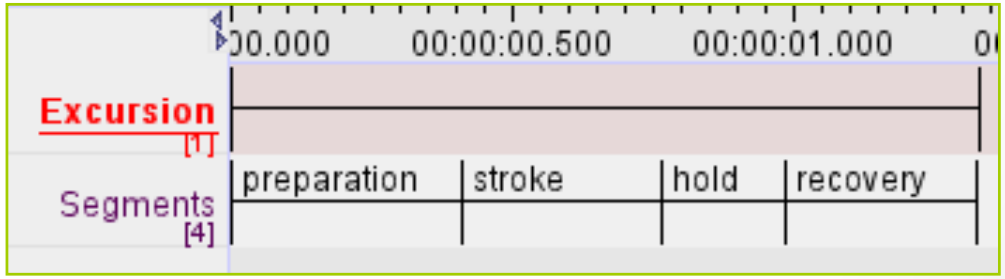
- A tool for coding whole body movement behaviour in space e.g., everyday life, sports, dance (Lausberg 2010)

2. Minimal requirements of a gesture analysis with ELAN

i. Linear structure
ii. Form features

Linear structure
(Kendon 2004: Appendix 1)





Four manual parameters (Bressem, ms.)

Articulators can be described formally based on four parameters:

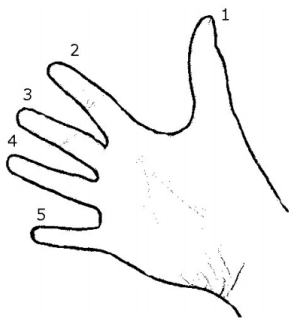
1. Hand shape
2. Palm orientation
3. Location
4. Movement

1. Hand shapes

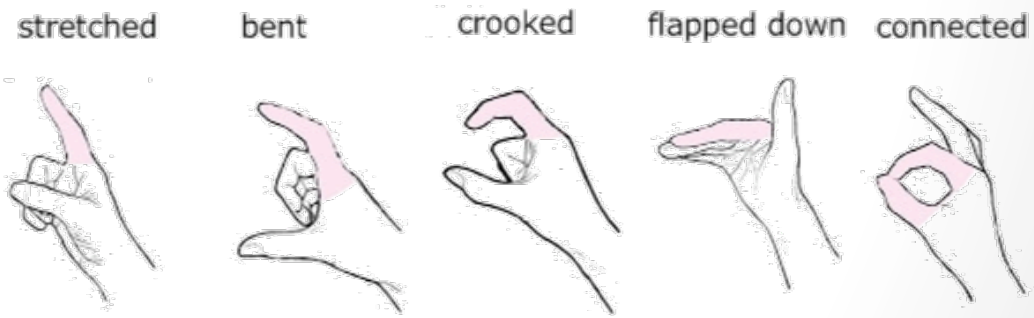
(Bressem, MS)

- **Form clusters for hand configuration**

- **Numbering of fingers**



- **Shape of digits**



2. Palm Orientation

(Bressem, MS)

- depending on 1.) palm and 2.) gesture space
- orientation= orientation 1 + orientation 2 (e.g. palm lateral towards center (PLTC))

1. palm

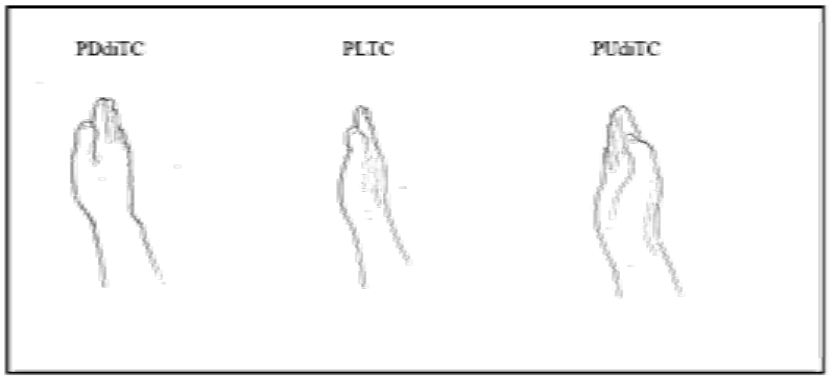
- palm up — PU
- palm down — PD
- palm lateral — PL
- palm vertical — PV

- marker „diagonal" — Di

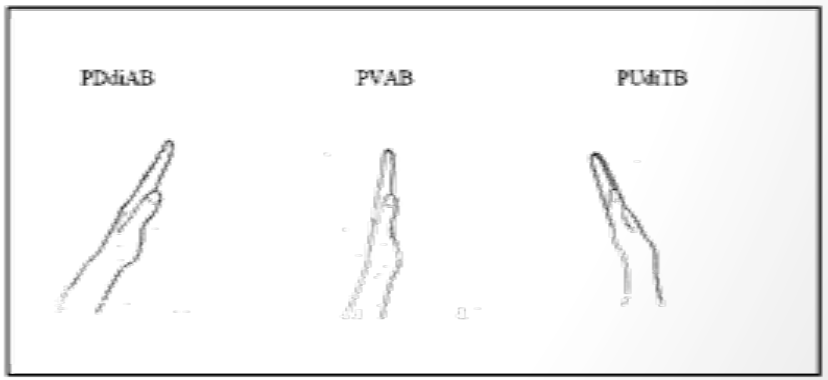
2. gesture space

- towards center — TC
- away center — AW
- towards body — TB
- away body — AB

diagonal orientation in relation to body centre line (viewed from above)



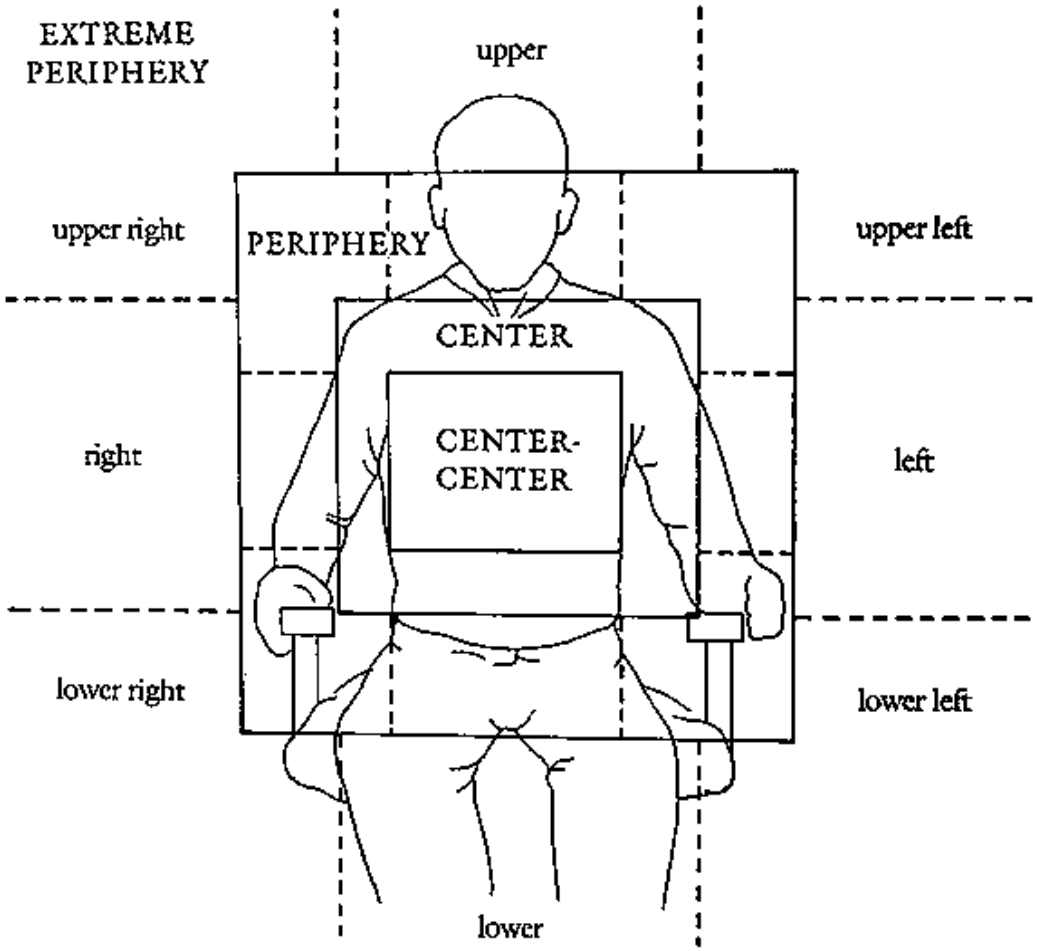
diagonal orientation in relation to body of speaker (viewed from the side)



3. Location

(Bressem, MS)

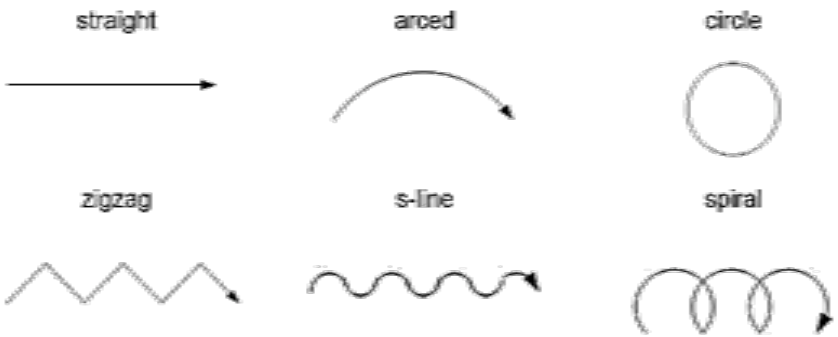
- “McNeill’s gesture space” (following McNeill, 1992)



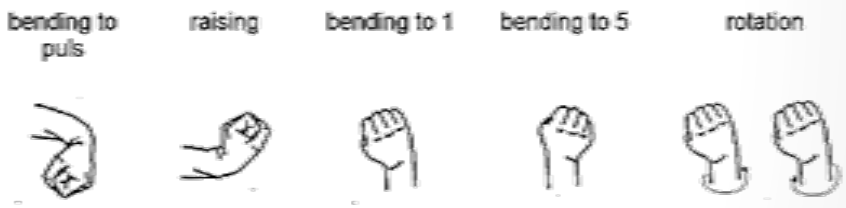
4. Movement

a. Type of movement

- Arm, shoulder or single fingers



- Wrist and single fingers



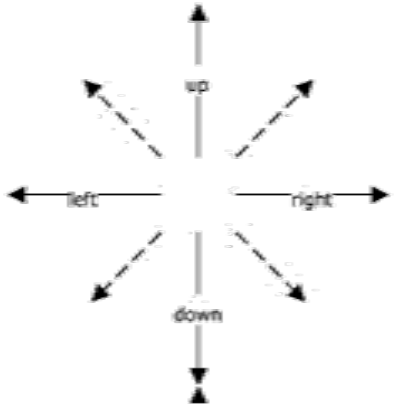
(figures taken from Prillwitz et al. 1989)

(Bressem, MS)

4. Movement

b. Direction of movement

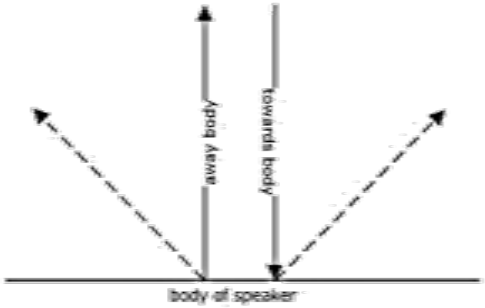
- Along vertical/horizontal axis



vertical axis: up, down
horizontal axis: right, left

marker diagonal: diagonal right up, diagonal left up, diagonal right down, diagonal left down

- Along sagittal axis



sagital axis: away body, towards body

marker diagonal: diagonal away body, diagonal towards body

- Spiral and circular

clockwise

counter clockwise

(figures taken from Prillwitz et al. 1989)

(Bressem, MS)

4. Movement

c. Characteristic of movement

1. Size of movement
   - Reduced
   - Enlarged
2. Speed of motion
   - Decelerated
   - Constant
   - Accelerated
3. Flow of movement
   - Accentuated ending

(Bressem, MS)

Conclusion

- First step: technical and methodological considerations
- Useful for quantitative and qualitative research
- ELAN is a flexible tool for different levels of complexity
- Advantages of ELAN
- ELAN facilitates interdisciplinarity
- Possibility for advanced options

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Thank you!

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