

Studying handwriting processes in school settings: Methodological approaches

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An old controversy ...

Field research:

- high ecological validity +
- participants are already there +
- no randomization –
- limited control of environment –

Laboratory research:

- high generalizability +
- causal inferences +
- artificial setting –
- absence of relevant conditions –

... and a paradox for writing

- ecology of school vs. ecology of life
- didactical traditions (or „customs“) of composition have little ecological validity
- focus on (formal) text product characteristics
- little transfer to true-to-life text types
- school research suggests group testing (differential vs. general psychology)
- higher generalizability of process variables

Maintaining the classroom setting

- assessing covariates (tests, questionnaires)
- obtaining text products after instructions
- setting time limits (typical vs. optimal achievement)
- self-monitoring of time consumption
- collective dual-task conditions
- digital traces with graphic tablets
- digital traces with keystroke logging

Registration of handwriting

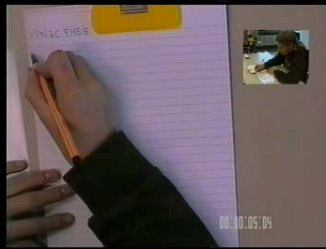
- digital tablet → graphical traces
 - basic motor patterns
 - speed, acceleration, direction of strokes
 - pen hold pressure, pressure on surface
- automatic letter recognition software?
- the „model“ of keystroke logging
 - time course of meaningful units
 - easy access to letter/word/sentence level
 - repeatability of the writing process

Video observation: technical equipment

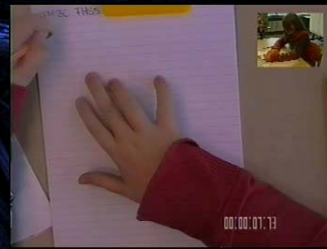


Video observation

- video record of handwriting from above
- synchronization with writer's behavior
- time scale inserted



right-hander



left-hander

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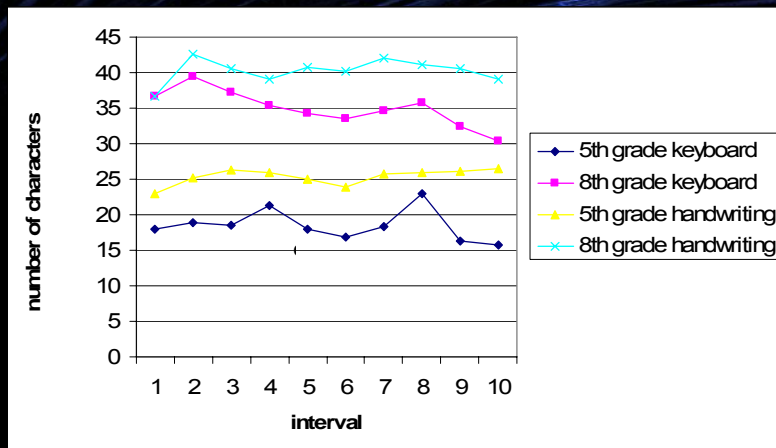
Analysis I

- product variables
 - number of deletions
 - number of orthographical errors
 - number of correspondence errors (copy task)
 - quality measures (creation task)
- total time on task
- temporal progression
- chunk size per gaze (copy task, description)

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Exemplary result: writing progression



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Analysis II

- treating the writing process like a sequence of events
- using classroom observation software
 - INTERACT V8
- coding visual events along a time scale (e.g., each 12 frames of 25 Hz)
 - pen up/pen down (pauses)
 - gaze to given text/gaze to writing sheet
 - which letters are being written
- detecting event patterns
- direct jumps to coded events in the movie

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Video observation from below



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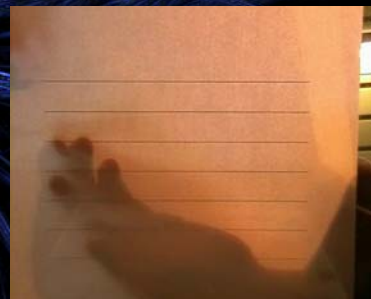
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Video observation from below

- semi-transparent writing sheet
- double-mirror image
- no obstruction of writing trace



right-hander



left-hander

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Conclusions

- eye-tracking needs
 - (expensive) technical equipment
 - restricted working place
 - strict laboratory conditions
- video equipment widely available
- classification/linguistic interpretation of written traces for each kind of writing record (beyond simple temporal analyses)
- organizational advantages through on-site experimentation in schools
 - availability of participants
 - little selection of participants/parents' agreement
 - participants behave like in school

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SIGWRITING 2010

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Special Interest Group on Writing**

8th to 10th of September 2010

University of Education at Heidelberg, Germany