COMPOST
Identification of indicators for competence assessment of students’ essays:

How do Textual Indicators Evolve?

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Tübingen, December 5th, 2011

http://www.linguistik.hu-berlin.de/institut/professuren/korpuslinguistik/forschung/kompost/compost
Overview

I Introduction
   Purpose, aims and examples

II Data

III Methodology

IV Results and implications

V Work in Progress

VI Future Work

VII Conclusion
Aim:
- find (new/interesting) indicators for language quality in essays
- Measure how the indicators evolve over time
Purpose:
- Identify pupils with special needs in language training

Side effects
- Data for developing or improving competence models
Essay corpus – collected during the longitudinal study KESS (Kompetenzen und Einstellungen von Schülerinnen und Schülern – competences and attitudes of pupils)

Programme for student assessment KESS: complete survey of a year of pupils in Hamburg

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>KESS4 – 2003 (1 topic)</td>
<td>839</td>
<td>ca. 8000</td>
<td>KFT</td>
</tr>
<tr>
<td>KESS7 – 2006 (2 topics)</td>
<td>126 (of appr. 1500)</td>
<td>63 and 63</td>
<td>Reading comprehension</td>
</tr>
<tr>
<td>KESS8 - 2007 (13 topics)</td>
<td>1705</td>
<td>1705</td>
<td>C-test, grammar, vocabulary, spelling, reading comprehension</td>
</tr>
<tr>
<td>KESS10 - 2009 (6 topics)</td>
<td>1189</td>
<td>Not yet rated, 1189</td>
<td>C-test, spelling, reading comprehension</td>
</tr>
</tbody>
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Example: task from grade 4

Texts are digitized (typed manually)

Interpretation begins when texts are digitalised

That is decisions at this point affect results
Annotation

- Operationalise features that shall be determined automatically
- Operationalisation which can be applied automatically. How can features be identified?
- Check quality of annotations
- Determine frequencies
Only what is annotated can be counted

Interpretation is continued

Errors can be inserted during annotation
IV Results: Word length

- x: grade
- y: letters per word
IV Results: Commas

commas

x: grade
y: commas per 100 words
IV Results: -heit, -keit, -ung

x: grade
y: -heit, -keit, -ung per 100 words
Word length is one of the most reliable features

Certain suffixes show an evolvement, but not all
Good starting point

- But, from there we want to go further

- Word length is a number, cannot be interpreted in terms of content/structure

- An approach that is motivated more by a linguistic point of view

- Analysis of suffixes, problem: choice and data sparseness

- Combine both → look at structure of words and how that develops over time
Skim through tokens with high word length

Look at morphological structure, complexity

For simplicity we assume

Prefix, Suffix, Lexemes, Flexives

We want to look at combinations

E. g. Prefix + Lexeme + Suffix

Case study with prefix + lexeme + -ung

High number of occurrences

Example: <Auf><frisch><ung>
x: grade
y: forms per 100 words
V Work in Progress: Preliminary Results – KESS4

216 –ung

109 <prefix><lexeme+|prefix*|suffix*><ung>

<Ver><mut><ung>
<ent><vern><ung>
<An><leit><ung>
1511 –ung
569 <prefix><lexeme+|prefix*|suffix*><ung>

<An><leit><ung>, <ver><spät><ung>,
  <Ver><pflicht><ung>
<Vor><wahrn><ung>, <er><källt><ung>
<Um><satztsteiger><ung>

False positives: <Er><derwärm><ung>
902 –ung

457 <prefix><lexeme+|prefix*|suffix*><ung>

<Ab><mahn><ung>, <Ver><zweifl><ung>
Type/token ratio – ung bzw.

\[<\text{prefix}><\text{lexeme}+|\text{prefix}^*|\text{suffix}^*><\text{ung}>\]
Focus: How do word structures of students develop?
Prefix chains
- <un><ent><schied><en>
Suffix chains
- <Tät><ig><keit>,<Pünkt><lich><keit>
Combination of several prefixes and suffixes
- <prefix><prefix><lexeme><suffix>
  - <un><be><greif><lich>,<un><ver><kenn><bar>
- <prefix><lexeme><suffix><suffix>
- <Über><pünkt><lich><keit>
Evolvement of indicators over time

From surface indicator word length and individual affixes to a more linguistically motivated analysis

Word length is not well interpretable but tightly linked to morphological structure

Individual affixes (suffixes)

Structure of words

Qualitative analysis meaningful

How do students construct words and how does that develop over time?