An Investigation into the Lexico-grammatical Features of the Behavioural Process

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Outline

- Overview of Systemic Functional Linguistics (Halliday 1994) and the Behavioural process
- Aims
- Methods
- Results
- Summary and future research
Systemic Functional Linguistics (SFL; Halliday 1994) concerns how language conveys meaning.
Behavioural Process

- “construe an external (‘material’) perspective on processes of consciousness” (Davidse 2017:81)

- “processes of (typically human) physiological and psychological behaviour” (Halliday and Matthiessen 2014:301)

- Eg. Listening, laughing, coughing, crying
Typical criteria for Behavioural processes

- Intransitive (although some transitive)
- Unmarked progressive aspect (present-in-present and sometimes present)
- Animate subject
- Cannot project (that complement)

Table: Summary of three process types

<table>
<thead>
<tr>
<th>Process Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>John hit the ball / John is running</td>
</tr>
<tr>
<td>Mental</td>
<td>John likes Jane / John believes that cricket is the best sport</td>
</tr>
<tr>
<td>Behavioural</td>
<td>John laughed a hoarse laugh / John is shaking</td>
</tr>
</tbody>
</table>
Relatively Low Frequencies

Frequency of Intransitive constructions:

- **7173 total**
  - **31.2%** (2241) intransitive
    (26.2% (1878) bare intransitives)
  - **68.8%** (4932) transitive

Matthiessen’s (1999) probabilities for the system of process type

XTAG Research Group (1998)
Challenge of the Behavioural Process

- Least clear cut – “No clearly defined characteristics” (Halliday 1994, p.139)

- Intransitive although sometimes transitive

- Typically involuntary yet represent voluntary perception experiences e.g. hearing vs. listening (Banks 2015, p.24)
There are no clear grammatical distinctions between **intransitive** material processes and behavioural processes – only meaning.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Process: material</th>
<th>Manner: comparison</th>
<th>Extent: temporal</th>
</tr>
</thead>
<tbody>
<tr>
<td>the two creatures</td>
<td>had been jumping about</td>
<td>like mad things</td>
<td>all this time</td>
</tr>
<tr>
<td>we</td>
<td>can dance</td>
<td>without lobsters</td>
<td></td>
</tr>
<tr>
<td>Behaver</td>
<td>Process: behavioural</td>
<td>Accompaniment: comitative</td>
<td></td>
</tr>
</tbody>
</table>

Halliday and Matthiessen 2014: 333

- Prototypical uses easier to analyse
  - *I laughed at that*: 93% Behavioural, 4% Mental, and 3% Material

- Borderline cases more difficult -> caused by deviations in semantic and syntactic information
  - *and talked about his hometown*: 40% Behavioural, 53% Verbal, and 7% Material

- Problem for the theory
Aims

• To empirically test the theoretical criteria of the Behavioural Process

• To identify if there are some more subtle lexico-grammatical features that these processes display, that would help us to validate the category
Method

- Investigated instances of Behavioural Processes using corpus data

- Involved manual analysis of Hanks’ (2004) Corpus Pattern Analysis, as well as other features including tense, aspect and mood
### Data collection

- **15 Behaviours** (Halliday 1994) and (Banks 2015)
- **5 semantic categories:**
  - Psychological
  - Communicative
  - Physiological

<table>
<thead>
<tr>
<th>Psychological</th>
<th>Communicative</th>
<th>Physiological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception</td>
<td>Cognition</td>
<td>Emotion</td>
</tr>
<tr>
<td>Look</td>
<td>Ponder</td>
<td>Frown</td>
</tr>
<tr>
<td>Stare</td>
<td>Ruminate</td>
<td>Laugh</td>
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<td>Listen</td>
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<td>Talk</td>
<td>Hiccup</td>
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<td></td>
<td>Converse</td>
<td>Shiver</td>
</tr>
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<td></td>
<td>Gossip</td>
<td>Sneeze</td>
</tr>
</tbody>
</table>

- **Corpus of Contemporary American English (COCA; Davies 2008-)**
- **30 x 15 -> 450 concordance lines**
Data Analysis

- Corpus Pattern Analysis (CPA; Hanks 2004)

**PDEV: meditate**  This is a first draft which has not yet been checked.  Access full data

1  **Pattern:** Human meditates  
    Implicature:  Human focuses their minds on calm thoughts in order to achieve an altered state of consciousness  
    Example:  Then I sat down to meditate, with the sacred choral music playing softly in the background.

2  **Pattern:** Human meditates on or upon Entity or on or upon Eventuality  
    Implicature:  Human thinks deeply and at length about Entity or Eventuality  
    Example:  He liked to take ideas gently, to get time to meditate on the best modes of expressing truth.

✓ CPA Ontology  
✓ Considers frequencies  
✓ Reveals the different senses of each verb use
Grammatical Aspect: the expression of time by grammatical items (Van Rompaey 2013)

- **Perfective**: view all parts of the situation as a whole
  - *He cleans his apartment*

- **Imperfective**: depicts the situation as incomplete and ongoing (*-ing* form)
  - *He is cleaning his apartment*

- **Habitual**: “a situation which is characteristic of an extended period of time” (Comrie 1976:27-28) Eg. *He sells cars*

- **Iterative**: “a situation [...] repeating itself on one or more occasions” (Declerck et al. 2006:35) Eg. *He sneezed three times*
Lexical Aspect (Aktionsart)
- a semantic category that concerns how “the action of the verb proceeds” (Karl Brugmann, cited in Brinton 1988:2)
- analysis was carried out according to five types state, activity, accomplishment, culmination or semelfactive (Van Rompaey 2013)
- involves analysis of key notions to identify these categories:
  (Stative/dynamic, durative/punctual, evolving/non-evolving, telic/atelic, agentive/non-agentive, transitional/non-transitional)
Data Analysis

• Stative / dynamic – change, motion, activity (be sick / tell a story)
• Durative / punctual – last in time (save lives / choose a film)
• Evolving / non-evolving – gradual change (become clear / kill someone)
• Transitional / Non-transitional – sudden change from one state to another, lead up events (win a race / knock on the door)
• Telic / atelic – inherent end point (bake a pie / keep secrets)
• Agentive / non-agentive (kill someone / become famous)
Data Analysis

Table 1: Van Rompaey’s (2013) summary of lexical aspect categories

<table>
<thead>
<tr>
<th></th>
<th>Dynamicity and Durativity</th>
<th>Telicity</th>
<th>Agentivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>state</em> (Vendler 1957 and Moens &amp; Steedman 1988)</td>
<td>stative</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>activity</em> (Vendler 1957) or <em>process</em> (Moens &amp; Steedman 1988)</td>
<td>dynamic and durative or evolving</td>
<td>-</td>
<td>±</td>
</tr>
<tr>
<td><em>accomplishment</em> (Vendler 1957) or <em>culminated process</em> (Moens &amp; Steedman 1988)</td>
<td>dynamic and durative</td>
<td>+</td>
<td>±</td>
</tr>
<tr>
<td><em>achievement</em> (Vendler 1957) or <em>culmination</em> (Moens &amp; Steedman 1988)</td>
<td>dynamic and punctual and transitional</td>
<td>N/A</td>
<td>±</td>
</tr>
<tr>
<td><em>achievement</em> (Vendler 1957), <em>series</em> (Brinton 1988), <em>point</em> (Moens &amp; Steedman 1988) or <em>semelfactive</em> (Smith 1991)</td>
<td>dynamic and punctual and non-transitional</td>
<td>N/A</td>
<td>±</td>
</tr>
</tbody>
</table>
Results

- Lexico-grammatical features
  - Animacy, intransitivity, *that* complements, lexical aspect and grammatical aspect

- No apparent trend according to the five semantic groups of Behavioural Processes
• Animacy

![Animate Subject Distribution across 15 Behaviours](chart.png)
Results

- Intransitivity

Transitivity Distribution across 15 Behaviours

- Intransitive
- Transitive
Results

- *that* complement

- THAT complement Distribution across 15 Behaviours

- Graph showing distribution of *that* complement across 15 behaviors, with some behaviors having a projection component.
Results

- Grammatical aspect (present tense clauses)
Results

- Lexical aspect

![Lexical Aspect Distribution across 15 Behaviours](chart.png)
Results

- Pattern number frequency

- The most frequent pattern use of these verbs were in line with criteria of the behaviourals besides ponder (60% mental)

- Hypothesize: higher the pattern number, the less prototypical of the behavioural category

<table>
<thead>
<tr>
<th>Verb</th>
<th>Number of patterns</th>
<th>Number of patterns representing Behavioural Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Hiccup</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Ruminate</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Talk</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Listen</td>
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<td>2</td>
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<td>Stare</td>
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</table>
The correlation between the prototypicality of verbs (within a particular semantic category) and their polysemy.

$r_s = -0.4344854, p = 0.05$
Summary

- Theoretical proposals of lexico-grammatical reactances generally confirmed
  - Imperfective aspect

- Higher the pattern number, the less prototypical of the behavioural category
Future research

- Larger scale comparison with intransitive material processes
  - 250 x 10 verbs (1250 behavioural/material)
  - Lexico-grammatical reactances → differ in grammatical aspect?

- Investigate certain constructions – intransitive meaning
References

Results

- Grammatical Aspect (full dataset)