Using content analysis to study executive personality on a large-scale

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2016 CONTENT ANALYSIS PDW
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Theoretical Roots & Development

Lexical Hypothesis

Language-based tools

Small-scale CEO studies

Large-scale CEO studies?

Individual personalities

Leader dispositions

Employee dispositions

Survey-based tools

Lexical Hypothesis
Content Analysis of CEO Dispositions

Data Sources
- Letters to shareholders (Gamache et al, 2014)
- Earnings calls
- Interviews

CEO Dispositions

Narcissism
Personal pronoun usage
(e.g., Chatterjee & Hambrick, 2007, 2011; Gerstner et al, 2013; O’Reilly et al, 2014; Reina et al, 2014; Resick et al, 2009; Zhu & Chen, 2015a, 2015b)

Regulatory focus
Promotion/prevention words
(e.g., Gamache et al, 2014; Kolev et al, 2015)

Temporal focus
Past/present/future words
(e.g., Nadkarni & Chen, 2014)

Analysis Tools
- LIWC
- DICTION
- CAT Scanner

Big 5 personality traits?
## Big 5 Personality Traits *(Costa & McCrae, 1985)*

<table>
<thead>
<tr>
<th>Trait</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extraversion</strong></td>
<td>tendency to be sociable, gregarious, active, and positive as well as the desire to be dominant and assertive <em>(Costa and McCrae, 1985)</em></td>
</tr>
<tr>
<td><strong>Neuroticism</strong></td>
<td>(Emotional stability) tendency to show emotional instability which manifests as higher stress, anxiety, anger, hostility, impulsiveness, and <em>(Judge and Ilies, 2002)</em></td>
</tr>
<tr>
<td><strong>Agreeableness</strong></td>
<td>tendency to be kind, gentle, altruistic, trusting and trustworthy, and warm <em>(McCrae and Costa, 1987)</em></td>
</tr>
<tr>
<td><strong>Conscientiousness</strong></td>
<td>tendency to be achievement-oriented, dependable, orderly, deliberate, and self-disciplined <em>(Costa and McCrae, 1992)</em></td>
</tr>
<tr>
<td><strong>Openness</strong></td>
<td>tendency to be creative, flexible, curious, and unconventional <em>(McCrae, 1996)</em></td>
</tr>
</tbody>
</table>
Personality Recognizer *(Mairesse et al, 2007)*

**Overview:**
- Analyzes written/spoken text & computes Big 5 on 7-pt. scale

**Development:**
- Inductive analysis
  - Assessed correlations b/w Big 5 & lexical categories from LIWC and MRC
  - Developed feature sets to “automatically recognize” Big 5
- Predicted survey scores with essays & recordings
  - 2k essays of psychology students *(Pennebaker & King, 1999)*
  - 15k utterances from 96 recordings of students *(Mehl, Gosling, & Pennebaker, 2006)*
  - Self- & observer reports using Big 5 Inventory *(John & Srivastava, 1999)*
- Procedure
  - Statistical models: classification, regression, & ranking
  - Algorithms: decision tree; naïve bayes; support vector machines (SVMs); etc.
Personality Recognizer (Mariesse et al, 2007)

Final Product: Java-based command-line program

- **Input:**
  - (1) file OR (2) directory

- **Models:**
  - (1) Linear regression;
  - (2) M5’ model tree;
  - (3) M5’ regression tree; OR
  - (4) Support vector machine with linear kernel

- **Types:**
  - (1) Observed personality from spoken language OR
  - (2) Self-assessed personality from written language

- **Output:**
  - Outputs Big 5 for each text file, standardized on sample
Applying Personality Recognizer to CEOs

Data:
- Lexis-Nexis Full Disclosure Wire (conference calls)
- The Wall Street Transcript database (interviews)
- 300k transcripts $\rightarrow$ 893k speaker files

Sample:
- 6,808 CEOs of S&P 1500 firms from 2001-2012
- Analyze text attributed to CEO ($\sim$11.5k words/CEO)

Analysis:
- Built directory w/ all text files
- Ran Personality Recognizer:
  - Model: support vector machine
  - Type: observer ratings from spoken text
### Personality Profile Analysis

#### Personality Profiles of S&P 1500 CEOs (N=6,808)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>4.95</td>
<td>0.51</td>
</tr>
<tr>
<td>Extraversion</td>
<td>3.88</td>
<td>0.73</td>
</tr>
<tr>
<td>Openness</td>
<td>3.61</td>
<td>0.49</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>3.47</td>
<td>0.42</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>3.39</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**CV:**

- Neuroticism: 0.10
- Extraversion: 0.19
- Openness: 0.14
- Agreeableness: 0.12
- Conscientiousness: 0.16

#### Personality Profiles of General Workforce (N=71,867 ages 21-60)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuroticism</td>
<td>3.22</td>
<td>0.51</td>
</tr>
<tr>
<td>Extraversion</td>
<td>3.27</td>
<td>0.73</td>
</tr>
<tr>
<td>Openness</td>
<td>3.92</td>
<td>0.49</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>3.73</td>
<td>0.42</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>3.63</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**CV:**

- Neuroticism: 0.26
- Extraversion: 0.28
- Openness: 0.17
- Agreeableness: 0.19
- Conscientiousness: 0.20

*Scores for general workforce provided by Srivastava, John, & colleagues (John and Srivastava, 1999; Srivastava et al., 2003)*
## Assessing the Tool

<table>
<thead>
<tr>
<th>Area</th>
<th>Details</th>
<th>S</th>
<th>W</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductive approach</td>
<td>Optimizes scores</td>
<td>✓</td>
<td>✓</td>
<td>Predictive validity check</td>
</tr>
<tr>
<td></td>
<td>Strained correlations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No clear “winner”</td>
<td>Adaptable</td>
<td>✓</td>
<td>✓</td>
<td>Align use with data</td>
</tr>
<tr>
<td></td>
<td>Easy to apply inappropriately</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within-CEO reliability</td>
<td>Some variance across transcripts</td>
<td>✓</td>
<td></td>
<td>Word threshold ~10k words</td>
</tr>
<tr>
<td>Validity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construct validity</td>
<td>Validated on survey responses</td>
<td>✓</td>
<td>✓</td>
<td>Use observer ratings</td>
</tr>
<tr>
<td></td>
<td>10 – 25% of variance</td>
<td></td>
<td></td>
<td>Predictive validity check</td>
</tr>
<tr>
<td></td>
<td>(Step beyond demographics)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External validity</td>
<td>~6.8k CEOs vs. ~400 CEOs</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(across 9 “small scale” studies)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Word Threshold

Extraversion

Our sample:
11.5k words/CEO
Word Threshold

Our sample: 11.5k words/CEO
Resources

Selected References:


Websites:


◦ Personality Recognizer page: [http://farm2.user.srcf.net/research/personality/recognizer](http://farm2.user.srcf.net/research/personality/recognizer)