Differences in gesture use during truthful and fabricated account of a self-experience

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**Research Questions**

- **RQ 1**: Is there a difference in illustrator use between truth tellers (TT) and liars (L)?

- **RQ 2**: Is there a difference in speech patterns between TTs and Ls?
Agenda

- Background
- Literature Review
- Method
- Results
- Discussion
DePaulo et al.’s (2003) meta-analysis
- Differences in illustrator use

Caso et al. (2003)
- Differences in 7 different types of illustrator use when telling the truth and lying.

Vrij et al. (2008), DePaulo et al. (2003)
- Differences in speech patterns during deception
Background

- Embodied Cognition (Kinsbourne, 2006; Wilson, 2002)
- Cognitive Load Theory (Ekman & Friesen, 1972)
- Motor Learning (Cook, Mitchell, & Goldin-Meadow, 2008)
Embodied Cognition

- Deep cognitive and physiological connection between gestures and thought (Wilson, 2002)
- Co-expressiveness & Synchronicity (McNeill, 2005)
Cognitive Load

- The amount of energy required to control working memory
Cognitive Load Theory

- Cognitive load increases during deception
  - Cognitive multitasking (Vrij et al., 2008)
    - Come up with a credible story (DePaulo et al., 2003)
    - Appear to be convincing (DePaulo et al., 2003)
    - Monitor communicative partner’s reaction (Buller & Burgoon, 1996)
    - Keep the story consistent (Vrij, Semin, & Bull, 1996)

- Cognitive Load Theory (Ekman & Friesen, 1972)
  - Cognitive load influences V/NV behavior
Gesture use facilitate memory formation
(Cook, Mitchell, & Goldin-Meadow, 2008; Goldin-Meadow Nusbaum, Kelly, & Wagner, 2001)
Method
Hypothesis

- **H₁**: Liars are more likely to use fewer illustrators than truthtellers.
- **H₂**: Liars spend longer time to respond.
- **H₃**: Liars spend more time silence.
- **H₄**: Truthtellers talk more than liars.
- **H₅**: Truthtellers speak faster than liars.
Method

- Participants
  - N = 41
    - TT = 21
  - N = 12F; 18 – 23; (M = 19.52; SD = 1.6)

- L = 20
- N = 12 F
- 19 – 23; (M = 19.52; SD = 1.57)
Recruited through SONA
  - 1 research credit

Two groups: TT / L
  - TT – actually performed task
  - L – only read about performing task
    - Instructed to convince interviewer they performed task regardless
Study Design / Procedure
Study Design / Procedure

- Videotaped Structured Interview
  - Question of interest
    - “Describe in as much detail as possible everything you did once you entered this room.”
Behavioral Coding

- Gestures coded using BACS (Sweet & Pazian, 2008; 2011)
  - 7 subtypes of illustrators (Ekman & Friesen, 1972)
    - Batons, Deictic, Ideographs, Kinetographs, Pictographs, Rhythmic, Spatial

- Inter-rater reliability (% agreement only)
  - 92.7% overall
Transcription

- Response Latency
- Silences
- Word Count
- Speech Rate
Results
H1: Liars are more likely use fewer illustrators than truth tellers.

\[ F(1, 38) = 1.28, \; p = .265 \]
# Results—Gesture Use

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean(SD)</th>
<th></th>
<th></th>
<th>t(39)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liars</td>
<td>Truthellers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baton</td>
<td>8.24(6.1)</td>
<td>7.1(4.2)</td>
<td>.726</td>
<td>n.s.</td>
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<tr>
<td>Deictic</td>
<td>26.2(19.6)</td>
<td>20.2(13.2)</td>
<td>1.16</td>
<td>n.s.</td>
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<tr>
<td>Ideograph</td>
<td>9.1(7.6)</td>
<td>8.6(7.5)</td>
<td>.189</td>
<td>n.s.</td>
<td></td>
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<tr>
<td>Kinetograph</td>
<td>5.9(6.3)</td>
<td>3.4(3.4)</td>
<td>1.59</td>
<td>n.s.</td>
<td></td>
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<tr>
<td>Pictograph</td>
<td>.62(1.1)</td>
<td>.52(1.3)</td>
<td>.181</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>All Gestures</td>
<td>50.1(33.6)</td>
<td>39.8(24.4)</td>
<td>1.12</td>
<td>n.s.</td>
<td></td>
</tr>
</tbody>
</table>
Results—Speech Pattern

- **H2**: Liars spend longer time to respond
  - $t(266) = -.29, p = .003$
H3: Liars spend more time in silence than truthtellers.

- \( t(272) = -2.16, p = 0.03 \)
Results—Speech Pattern

- **H5**: Truth tellers speak faster than liars.
  - $t(220) = 1.89, p = 0.05$
Discussion
Discussion

- Why Non-Significant Results?
  - Preparedness
  - Small sample size
Why did liar use more illustrators?

- Low cognitive load (Vrij et al., 2008)
  - Mental rehearsal
  - Lack of understanding about the experiment
  - Low-stake experimental design
- Self-Presentation Theory (DePaulo, 1992)
  - Purposeful attempt to control one’s behavior
Differences in speech patterns

- TT: Longer response latency & silence
  - Lack of preparedness & Self-presentation (DePaulo et al., 2003)
- TT: Faster speech rate
  - Actual memory aided their speech (McCormack et al., 2009)

- L: Fewer word counts
  - Lack of detailed memory (McCormack et al., 2009)
Conclusion

- Despite non-sig results examining behavioral differences is still potentially promising
  - Larger means for movements produced by liars suggest there is something there

- Follow up study
  - larger sample size
  - modify experimental design

- Long-range research could help inform law enforcement more quickly recognize those who are falsely confessing