The Sacramento Assessment of Confabulation (SAC)

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Good Morning, Chicago!

I’m from Sacramento
Is This Confabulation?

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Defining & Describing Confabulation

- Definition: the *unintentional* verbalization incongruous with the present situation (Dalla Barba, 1993)
- Is associated with frontal lobe damage (Dayus & Van den Broek, 2000)
- In particular with right-hemisphere frontal lobe damage (Joseph, 1999)
Further Defining & Describing

- Benson et al. (1995) suggest the orbital and medial frontal cortex as the mechanism for confabulation.
- Data from numerous studies are consistent with this suggestion (e.g., Papagno & Baddeley, 1997).

How have we been measuring confabulation?

- Measurement 1: My patient confabulates
  OR
- Measurement 2: My patient does not confabulate

Except...

- Dalla Barba (1993a) measured confabulation quantitatively.
- Required participants to answer a variety of questions, which required episodic memory, long term memory (including memory for famous people and events).
But...

- Dalla Barba’s questions were idiosyncratic to the French—e.g., French athletes, politicians, and battles.

Development of the Sacramento Assessment of Confabulation (SAC)

- Modeled after Dalla Barba’s questionnaire
- Research Questions:
  - Can we quantify confabulation beyond “does it/doesn’t do it?”
  - Do normal people score “normally” and differently than those with TBI?
  - If we can quantify it, what are the consequences for treatment of people with TBI (and possibly others)?
  - If we can quantify it, is there a relationship between confabulation severity and cognitive impairment severity?

Issues with the Truth

"Wait, those weren’t lies; they were just innuendo!"
From SAC: “When did the Vietnam War Start?”

- “You got me, Doc”
- “I think the US got involved in the 50s or 60s, but that was about the time of the A-bomb”
- 1910

Scoring scheme

- 1 = assumed accurate (with or without elaboration) or plausible or refusal to answer (“I don’t know”)
- 2 = possibly accurate, but includes inaccuracy, exaggeration, or elaboration that obscures the truth
- 3 = confabulation

For Example: When Did The Vietnam War Start?

- “You got me, Doc” (1)
- “I think the US got involved in the 50s or 60s, but that was about the time of the A-bomb” (2)
- 1910 (3)
Another Example: “What happened December 7, 1941?”

- “I don’t know” (1)
- “Pearl Harbor” (1)
- “People were getting ready for Christmas” (2)
- “I’m gonna say there was a fire.” (3)

Is This Confabulation?

“I would’ve told you all this yesterday, but I just made it up today.”

Why the SAC?

- To establish whether confabulation can be considered on a continuum
- To determine whether confabulation has potential as a measure in recovery
- To add precision to our description of confabulation
- To determine one’s willingness to “not know”
**Categories of Questions**

- Personal semantic
- Orientation (to time and place)
- General Semantic Memory

**Personal Semantic Examples**

- Have you ever had a head injury? If so, please tell me about it.

**Orientation**

- What is the day of the week?
- What is the date?
**General Semantic**

- When did the Vietnam War start?
- What happened December 7, 1941?
- What happened September 11, 2001?

**To whom did we administer this?**

- Normal individuals (n = 90)
  - Mean age 34.6 s.d.; 18.3
  - Males = 58; Females = 32

- Individuals with TBI (n = 31)
  - Mean age 39.9 s.d. 15.7 $F = .89$ (n.s.)
  - Males = 32; Females = 9 $F = 2.06$ (n.s.)

**How did they do?**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean SAC Score</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBI</td>
<td>15.03</td>
<td>4.21</td>
</tr>
<tr>
<td>Dementia</td>
<td>16.86</td>
<td>5.79</td>
</tr>
<tr>
<td>Control</td>
<td>10.40*</td>
<td>.93</td>
</tr>
</tbody>
</table>

*(F = 61.93; df = 2; 143; p = .000)*

*Control group significantly lower than TBI, Dementia groups*
Do normal people score “normally” and differently than those with TBI?

• Answer: Yes, significantly better, and a mean of 10.4 (10 is a “perfect” score, and 30 is the “worst” possible)
Consequences for treatment

• Reinforcing “I don’t know” or even “I don’t know, but…”
• Rating confidence of assertions/statements

Case Study

• Dr. C, a 63 year-old professor, collapsed in 1998 while giving a lecture. CT scans revealed an aneurysm hemorrhage involving the right frontal lobe and medial portion of the left frontal lobe. Dr. C did not have aphasia, but frequently confabulated, with severe episodic memory deficits.
• Dr. C’s wife participated in therapy.

Therapy Questions

• We asked Dr. C some questions during every therapy session (19 sessions)
• Hypothesis: since Dr. C has answered a question (i.e., has "heard himself speak"), he may have more confidence in his correct answers than his incorrect ones.
• Hypothesis: if a person (his wife) is there to verify the accuracy of his responses, his confidence might be more closely aligned with the truth— that is, he might begin to question his confabulations.
**Treatment Paradigm**

- Ask question (to Dr. C) that could be verified by Ms. C
- After he gave his answer, asked him how confident (1-10) he was that it was correct
- Ms. C verified accuracy
- We discussed it—and the option of “I don’t know” or “I’m not sure”
- Next question

**Example**

- Larry: “Tell me the name of one person you spoke to yesterday other than Ms. C.”
- Dr. C: “I spoke with Bill Clinton.”
- Larry: “Okay, how confident are you that you spoke with Bill Clinton?”
- Dr. C: “Well, he was pretty elusive, so hmm. I guess I’d say about a 5.”
- [conferred in session with Ms. C, who verified that he had not spoken with Bill Clinton]
- Larry: “Dr. C, if I ask you who you’ve spoken to, it’s okay to take your time, or that you can’t remember. In fact, do you remember someone you spoke to yesterday?”
- Dr. C: “No, not really.”
- Larry: “Yeah, that’s more like it. Okay let’s move on.”

**Correct Answer Responses across 19 Sessions**

How Confident Are You That Your Answer is Correct? (Data for Correct Answers Only)
Incorrect Answer Responses Across 19 Sessions

How Confident Are You That Your Answer is Correct? (Data for Incorrect Answers Only)

Remaining Questions

• Does confabulation decrease on the SAC longitudinally/with progress in memory?
• Does confabulation decrease on the SAC longitudinally/with progress in cognitive status?
  • What if we gave the SAC to Dr. C pre- and post-treatment?

Remaining Questions

• What does this mean about our tentative operational definition about confabulation?
  • the unintentional verbalization incongruous with the present situation (Dalla Barba, 1993)
  • If it’s entirely unintentional, how do we explain that Dr. C had less confidence in his incorrect answers?
Out On a Limb, But…

- Could confabulation, as used here, be used to more precisely measure severity of cognitive-communicative impairment?
- We’ll see what happens longitudinally
- We need more data comparing SAC scores with other relevant measures (e.g., Rancho, WMS, etc.)

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