<table>
<thead>
<tr>
<th>Alexander Technique Concept</th>
<th>Related Scientific Concepts</th>
<th>Evidence?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positions of Mechanical Advantage</td>
<td>Ergonomics &amp; Biomechanics</td>
<td>Lots</td>
</tr>
<tr>
<td>Use Affects Function</td>
<td>Dynamic Postural Tone, Deep vs. Surface Muscles</td>
<td>Some</td>
</tr>
<tr>
<td>Direction</td>
<td>Intention, Motor Imagery</td>
<td>Some</td>
</tr>
<tr>
<td>Primary Control</td>
<td>Neck Physiology</td>
<td>A Little</td>
</tr>
<tr>
<td>Inhibition</td>
<td>Inhibitory Control</td>
<td>Lots</td>
</tr>
<tr>
<td>End-Gaining</td>
<td>Motor Preparation</td>
<td>Almost None</td>
</tr>
<tr>
<td>Faulty Sensory Appreciation</td>
<td>Sensation vs. Perception; Body Schema, Proprioception</td>
<td>Lots</td>
</tr>
<tr>
<td>The Force of Habit</td>
<td>Satisficing vs. Optimizing</td>
<td>Some</td>
</tr>
<tr>
<td>Unity of the Self</td>
<td>Embodied Cognition; Parkinson’s disease, Neural Circuitry</td>
<td>Some</td>
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</table>
PRESENT POSITION: UNIVERSITY OF IDAHO

Associate Professor
  Department Of Psychology & Communication

Affiliate Faculty
  Department Of Biological Sciences

Graduate Faculty
  Human Factors & Neuroscience
COLLABORATION WITH OTHER AT SCIENTISTS

With Tim Cacciatore: theory paper and Twister grant
With Monika Gross: studies on AT for care partners and patient populations
With Molly Johnson: data comparing AT teachers to matched controls
With Gabriella Minnes-Brandes & Patrick Johnson: qualitative study
With Tim Cacciatore, Patrick Johnson, and Andrew McCann: AT Science Website
<table>
<thead>
<tr>
<th>Research Topic</th>
<th>What's new or relevant?</th>
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<td>Relation to movement preparation</td>
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**Conclusion**
INHIBITION → INHIBITORY CONTROL

- Ability to withhold a response
- Important topic in
  - Neuroscience
  - Psychology
- Component of executive function
- Associated with choice
INHIBITORY CONTROL IS RELATED TO HABITUAL HEAD CARRIAGE

Stroop Conflict

Name the Colors

- Green
- Black
- Red
- Purple
- Blue
Subjects with poor inhibitory control shortened their necks before walking.

Baer, Vasavada, & Cohen, 2019
## TOPICS COVERED

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</table>

Conclusion
MOVEMENT IS NOT SEPARATE FROM THOUGHT

• “Cognitive centers” and “movement centers” are deeply interconnected
• This is most obvious in neurological disorders such as Parkinson’s
PARKINSON’S DISEASE AS OPPOSITE OF ALEXANDER TECHNIQUE

- Second-most common neurodegenerative disorder (1% over age 60)

- Cardinal Symptoms
  - Slow
  - Rigid
  - Stooped
  - Tremor

- Non-motor symptoms
  - Executive functions (e.g. inhibition)
  - Motivation
  - Proprioception/Kinesthesia
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<td>Direction / Postural Intention</td>
<td>Effects on tone, balance, and mobility</td>
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Can psychomotor intentions have global effects on the whole self, including posture and movement?
CAN POSTURAL INTENTIONS MODIFY BALANCE, TONE, AND MOBILITY?

- **Conditions**
  A. “Light” – Allow your bones to send you up.
  B. “Effortful” – Use muscular effort to pull yourself up tall.
  C. “Relaxed” – Stand as if you feel tired and heavy.

- **Protocol**
  - Brief instruction followed by performance of tasks
  - All subjects performed in all conditions

- **Participants**
  - 20 adults with Parkinson’s disease
  - 20 healthy older adults
POSTURAL INTENTION AFFECTS BALANCE

“Light” → Longest time in air & least balance disturbance

Cohen et al, 2020
INTENTIONS AFFECT MUSCLE ACTIVITY AND SPINAL COMPRESSION

Adapted from Cohen et al, 2016; 2020
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<td>Direction / Postural Intention</td>
<td>Intention changes postural tone and mobility</td>
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<td>Distribution of muscle tone following AT class</td>
<td>Group intervention for neck pain</td>
</tr>
<tr>
<td></td>
<td>Comparison to exercise</td>
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**Conclusion**
Alexander group classes reduce neck pain and activity of surface neck muscles.

Becker, Copeland, Botterbusch, and Cohen, 2018
REPLICATION & COMPARISON TO EXERCISE

AT group classes reduced reliance on surface neck muscles.
Exercise did not.

Becker, McIsaac, Copeland, and Cohen, submitted
If true, AT principles are out there in the world to be discovered.

Now is an opportune moment for AT experts to join the conversation. We need to show up.
THANKS TO MY RESEARCH FUNDERS