The Need for Brain Science to Enhance Pilates Education

1. Better client/patient outcomes
   - Learning new motor skills changes your brain
2. Apply research to practice
   - evidence-based Pilates instruction
3. Improve Pilates Certifying Instruction
   - more balanced pedagogy
   - more cutting edge continuing education

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Pilates is a Body-brain Experience

Embodied Brains

- Cannot dissociate your body from your brain

•"One of the major results of Contrology is gaining mastery of the mind over the complete control of your body." (Pilates & Miller, 2003, p19)

Joseph Pilates

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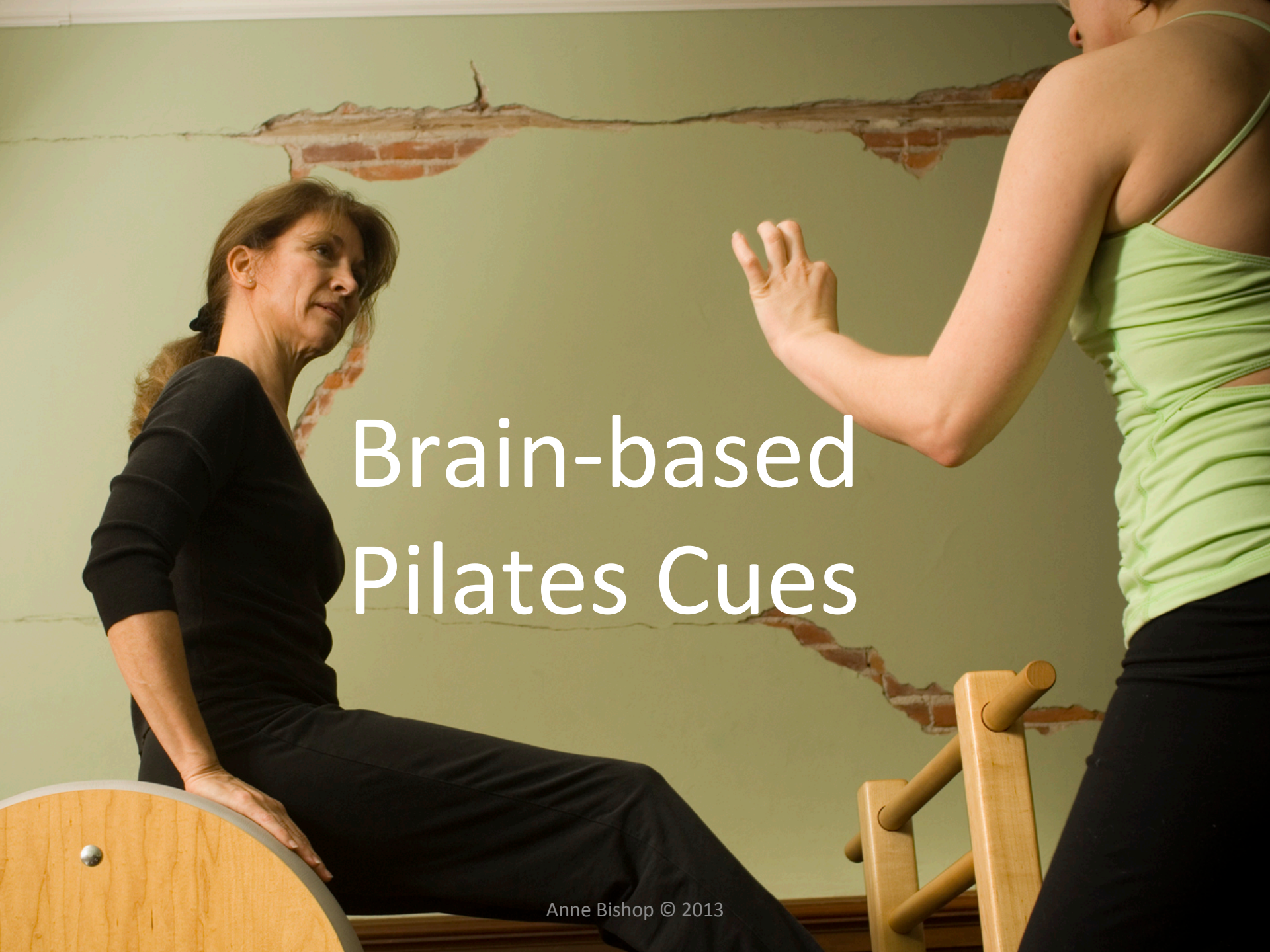
Brain-based
Pilates Cues
Anne Bishop © 2013

Brain-based Pilates Cues

enhance the neural activation in the brain responsible for feeling, planning and/or creating action & leads to better motor learning outcomes.

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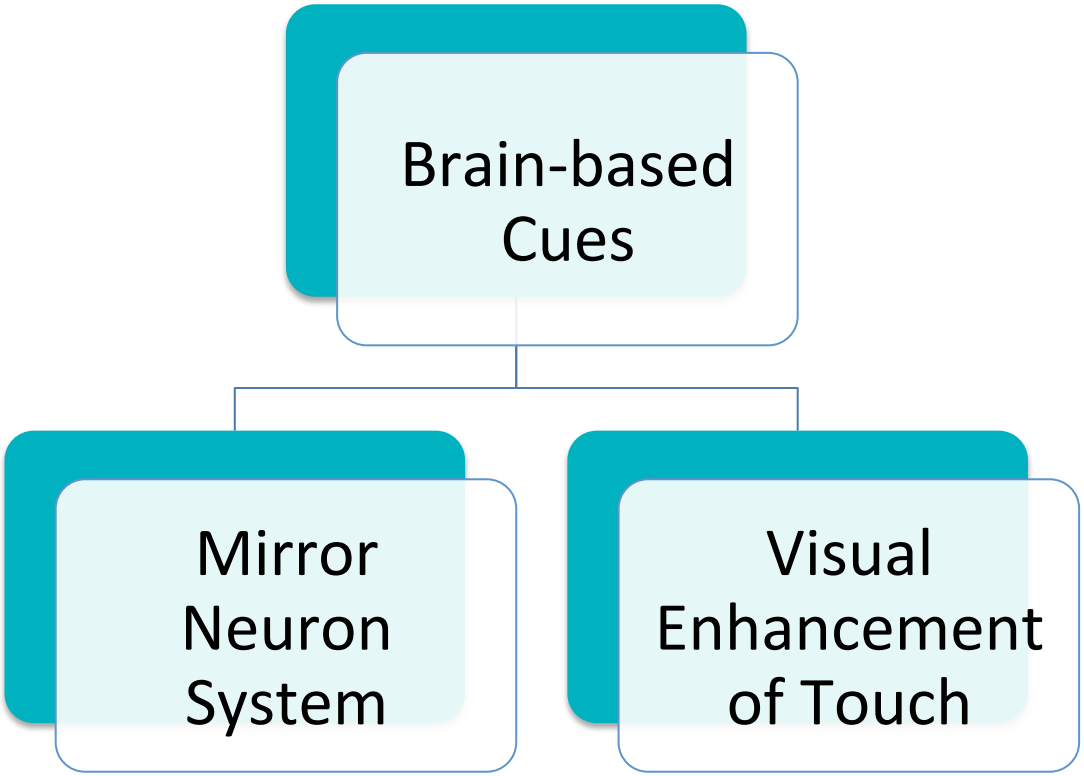
Brain-based Pilates Cues



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Mirror Neuron System

- Mirror Neurons
  - distributed throughout the brain in sensory (feeling), motor planning & action areas
  - help people understand action
  - respond to **goal-based** movement

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Optimize Pilates with Brain-based Cues

- Goal-based
  - Brain imitates most accurately when it understands the goal of a movement (Gazzaniga, 2009)

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Visual Enhancement of Touch (VET)

- VET
  - Combines visual and touch sensory systems
  - Enhances perception of a specific body areas

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Previous Research

- Patrick Haggard Ph.D.
  - University of College London (UCL)
  - Institute of Cognitive Neuroscience

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Available online at www.sciencedirect.com
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Consciousness and Cognition 17 (2008) 1181–1191

Consciousness and Cognition
www.elsevier.com/locate/concog

Visual enhancement of touch and the bodily self

Matthew R. Longo [a,b,*], Sean Cardozo [c], Patrick Haggard [a,b]

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Neuroscience and Biobehavioral Reviews 34 (2010) 224–236

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Review

Touch and the body

Andrea Serino [a], Patrick Haggard [b,*]

[a] Dipartimento di Psicologia and Centro studi e ricerche in Neuroscienze Cognitive, Università degli Studi di Bologna, Italy
[b] Department of Psychology and Institute of Cognitive Neuroscience, University College London

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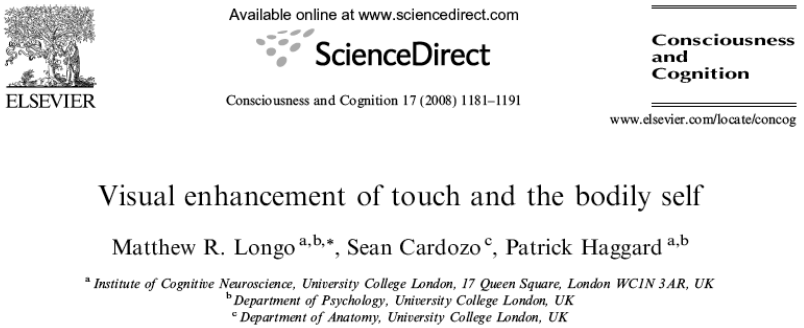
Longo, Cardozo & Haggard Findings

- "**VET involves,** at least in part, **an interaction between touch and a self-specific visual body image**, rather than a generic visual image of a body" (p. 1188)
- "**merely seeing a hand** can influence the sense of touch, even when the hand belongs to another person" (p. 1189)
- "an additional **VET occurs when the viewed hand is linked to the self,** rather than another person or object" (p. 1189)



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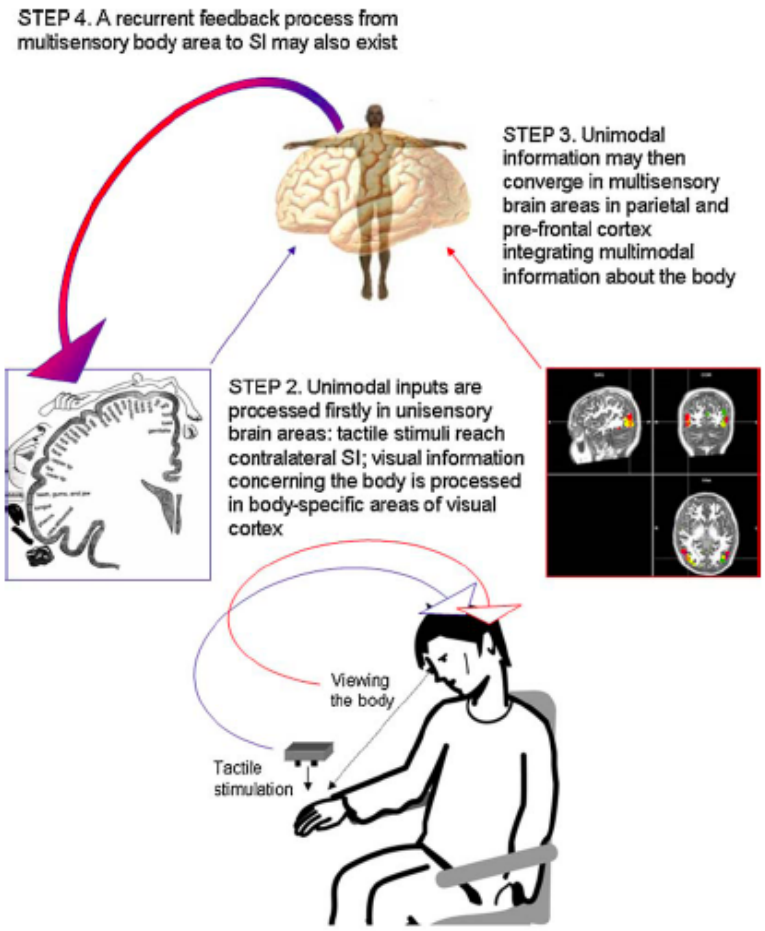
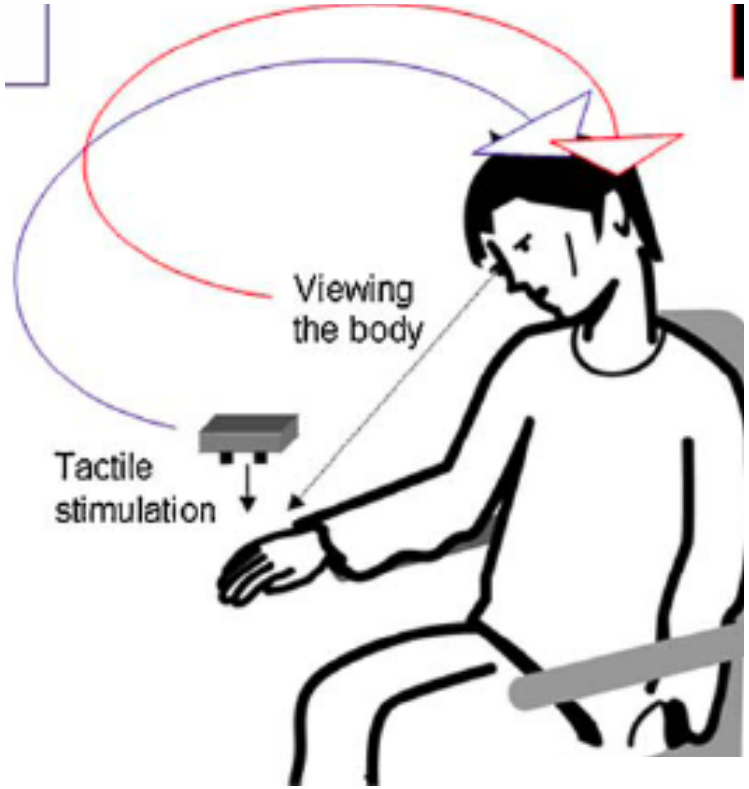
Using Multimodal Information



Research

- How can we use utilize brain research to inform mindful movement and practice?
- How can we use VET to improve motor skills in Pilates teaching and practice?



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The Role of Emotion, Vision and Touch in Movement Learning
Neuroplasticity and the Mirror Neuron System.

Jeanne Masterson
Dominican University of California

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Research

Positive Emotional States

- Does positive feedback enhance motor skill?
- Positive affect serves as a motivator for a physical goal. (Custers and Aarts, 2005)

VET

- Does using vision and touch combined improve motor skills?

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Methods Participants

- Subjects: N = 15
- Mean Age = 43.5 yrs old
- Control Group = 5
- Pilates Class = 5
- Pilates Class Positive Emotional Cues + VET= 5
  - Independent variable positive emotional cuing & VET

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Methods Materials

- Pilates Spring Boards
- Pilates ring 6-8”
- Inflatable Ball
- Mats

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Methods Measures

- Measured Perceived Self Efficacy (PSE)
  - 22 questions rating participants perceived level of ability
- Measured Motor Skills
  - maintain neutral
  - engage transverse abdominus
  - Ribcage flexion
  - shoulder blade stabilization
  - engage gluteus medius

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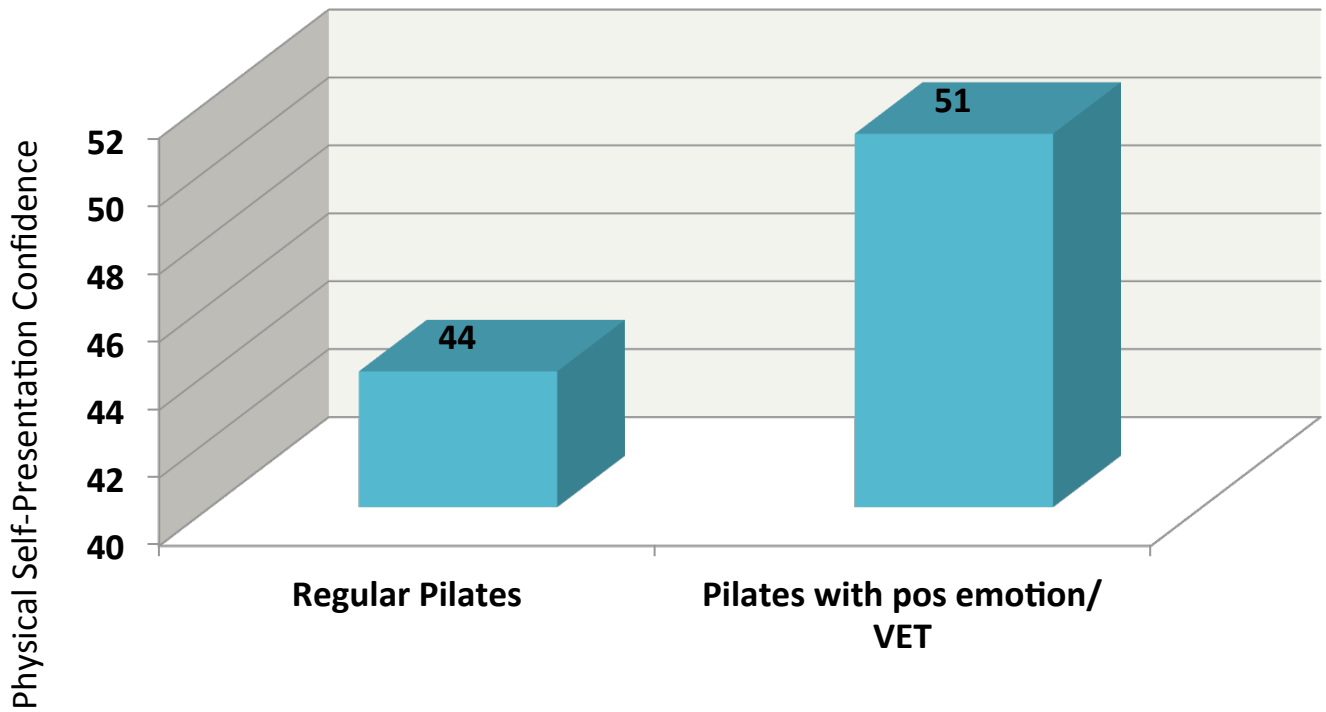
Procedures

- Control Group 1
  - Online Survey Pre & Post PSE
- Group 2 (Pilates)
- Group 3 (Pilates, Positive Affect & VET)
- Group 2 & 3
  - 2X week for 2 weeks 55-minute Pilates classes
  - Online Survey Pre & Post PSE
  - Motor skill measure on 6 point likert scale

Affective Results

Post test PSPC regular Pilates compared to Pilates with VET
***t*(6)=3.85<.0.05**



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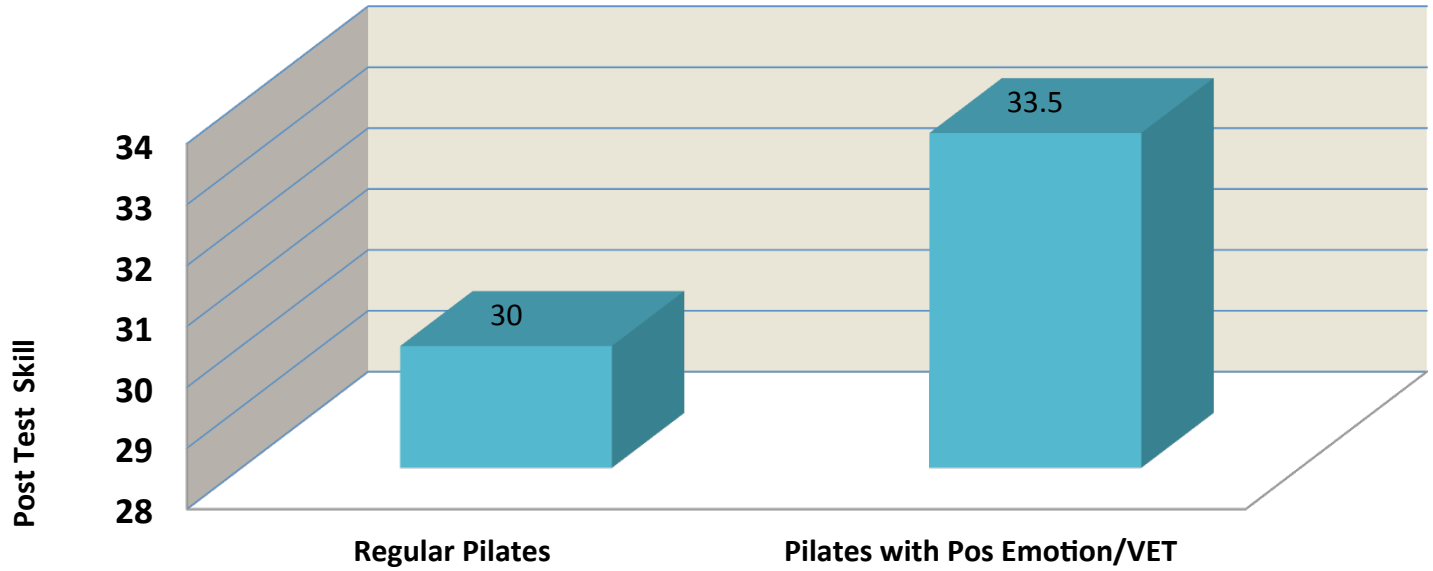
Motor Skill Results

Post Test Skill regular Pilates compared to Pilates with VET
***t*(6) 2.94, p<0.05**



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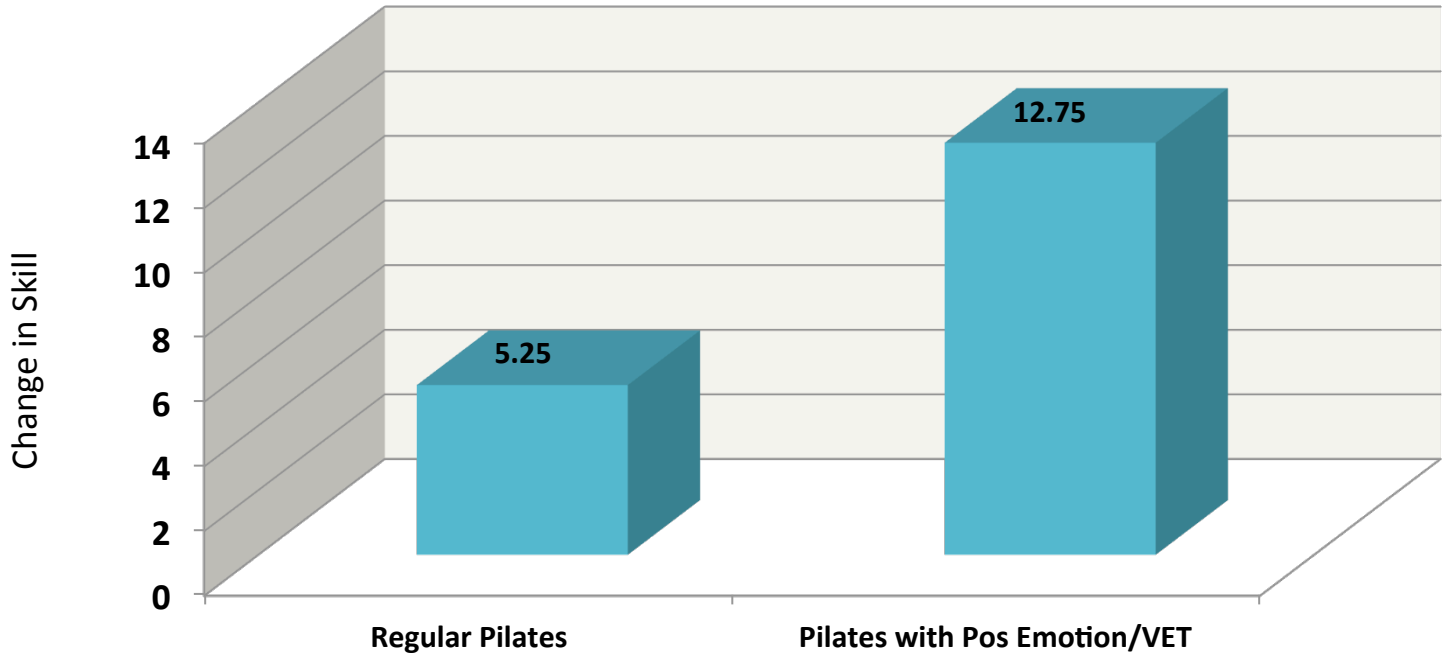
Motor Skill Results

Change in Skill regular Pilates compared to Pilates with VET
***t*(6) 3.82, p<0.05**



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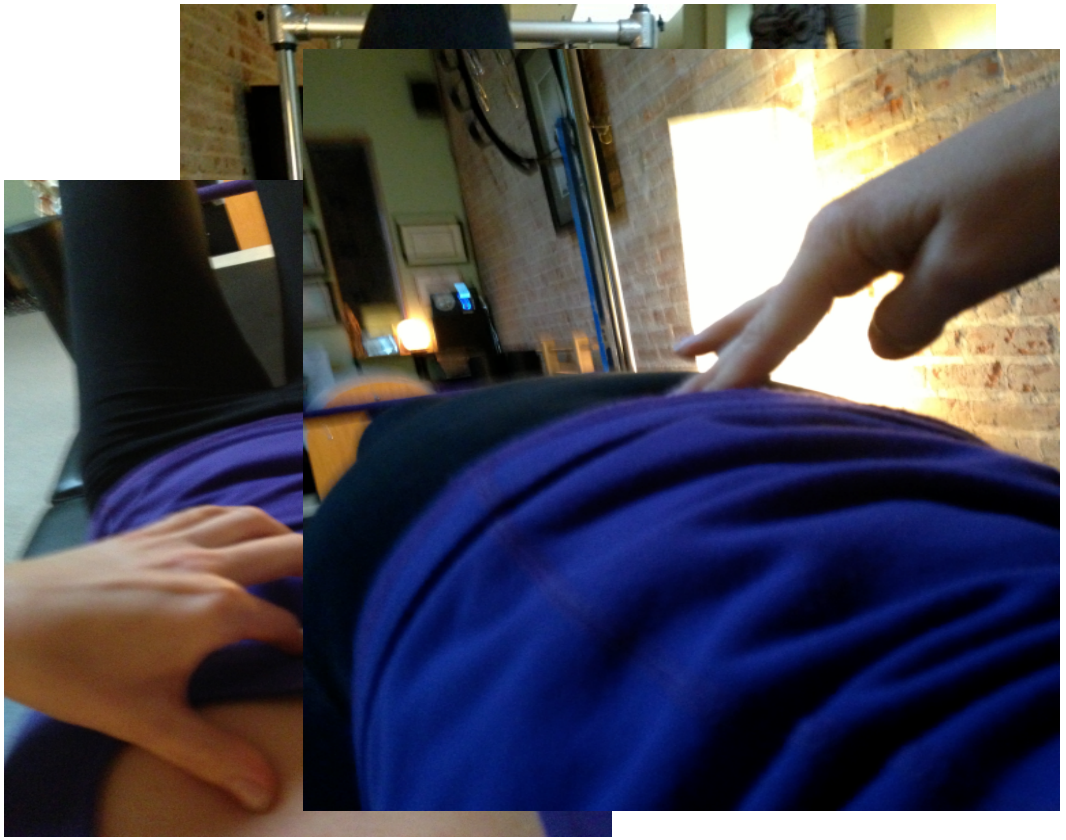
VET Cues

- Neutral Spine with March
- Forward Thoracic Flexion
- Gluteus Medius Engagement



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Optimize Pilates with Brain-based Cues

Use Positive Cues

- Give positive feedback
  - Authentic feedback
  - Clear positive feedback
  - Goal-based positive feedback

VET

- Neutral spine
- Transverse abdominus
- Ribcage flexion
- Shoulder blade stability
- Glut medius engagement

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Populations

- Populations Served
  - Post Natal
  - Post-Rehabilitation
    - Hip, Knee Replacement
    - Sensory Deficits
    - Stroke

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Future Directions

- Use more instructors
- Tease out positive cues from VET
- Expand
  - PT
  - specialized populations
  - mindful movement modalities
- Student teacher ratio

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Thank you!

Questions

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