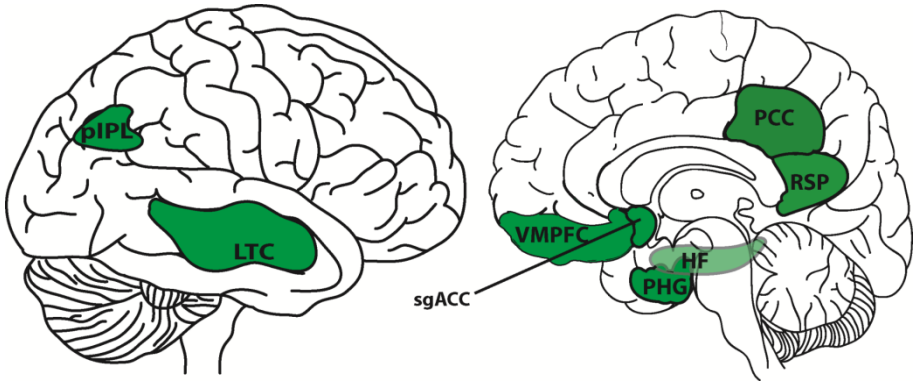
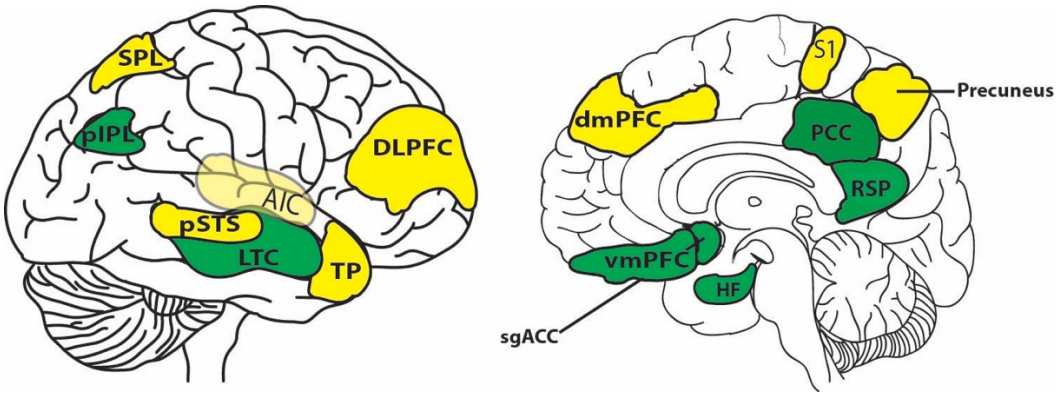
4 Neural Systems of Self Processing ("Selfing") modulated by mindfulness-based meditation practice



Narrative Self – [Hippocampal-Cortical Memory System]

- Evaluative Processing
- Autobiographical (self-referential) memory processing
- Mind-wandering (past and future processing)
- Default Network



Experiential Self - [Sensory/Central Executive Network)

- Primary Interoceptive & Exteroceptive processing without evaluation; mental noting
- Executive Processing – Basic attention (engagement/ disengagement), Working Memory (Maintaining Set)

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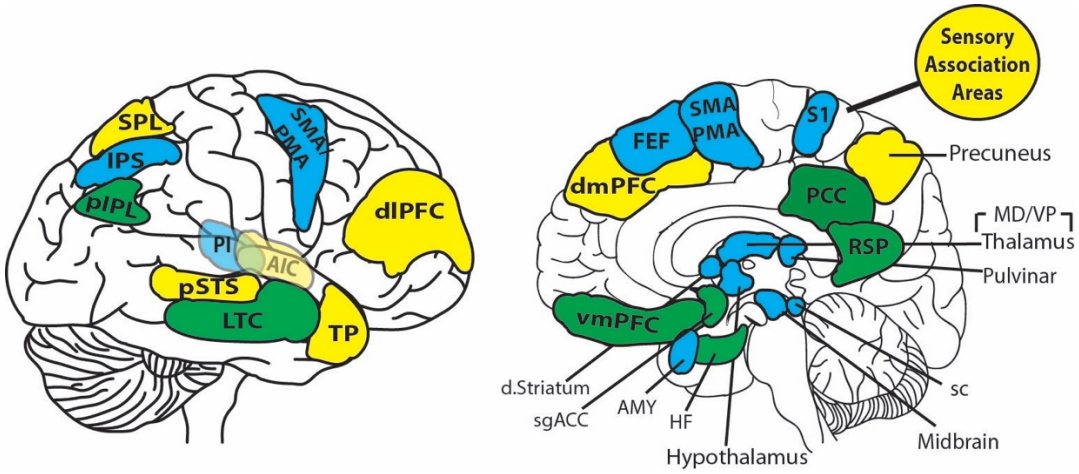
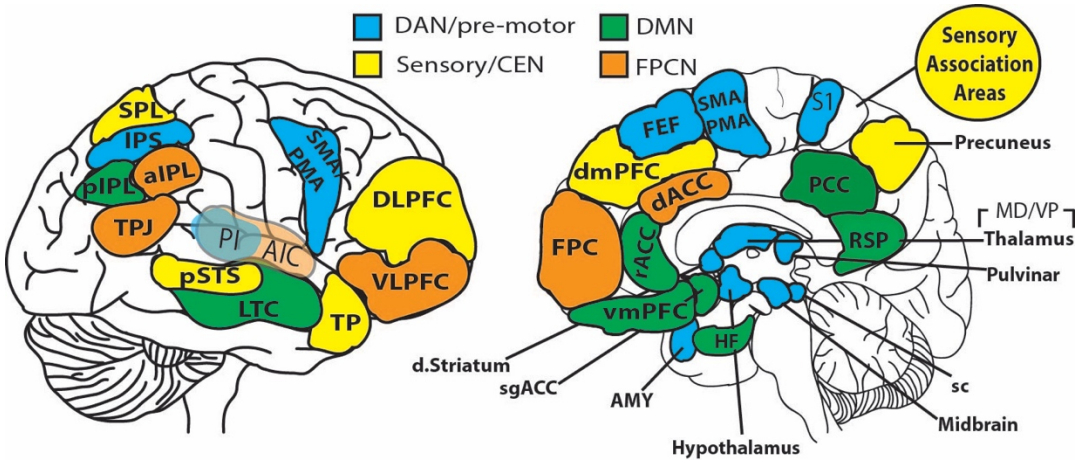


Enactive Self - [Dorsal Attention Network/pre-motor network]

- Basic Attentional processing (alerting, orienting)
- Non-conscious sensory-affective-motor processing
- Action Tendencies and automatic processing



Integrative/Meta-Self processing [fronto-parietal control network]

- Higher-order Attentional processing (executive monitoring, non-conceptual meta-awareness)
- Flexible switching between networks and integration of information
- Multi-tasking, prosocial memory

Lazar et al., 2000; Ritskes et al., 2003; Brefczynski-Lewis et al., 2007; Farb et al., 2007; Holzel et al., 2007; Pagnoni et al., 2008; Baerensten et al., 2010; Manna et al., 2010; Ives-Deliperi et al., 2011; Brewer et al., 2011; Hasenkamp et al., 2012; Vago et al. in prep)

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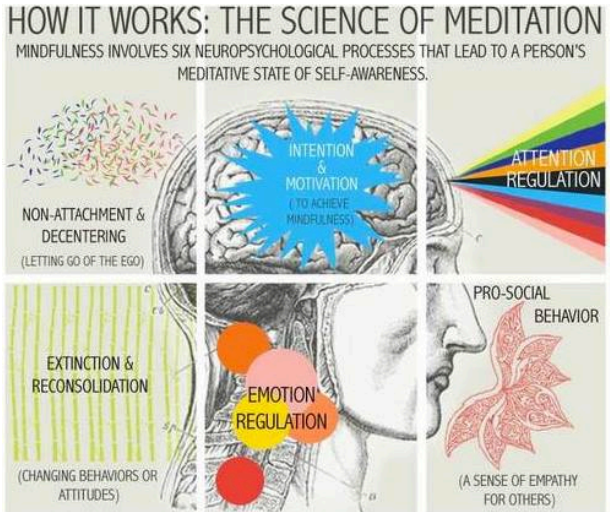

Six Neurocognitive Skills

Core Mindfulness-based Meditation Practices (Focused Attention, Open Monitoring, Loving-kindness, Hatha Yoga) improve Self-Awareness, Self-Regulation, & Self-transcendence (S-ART)

- **1) Intention & Motivation**
  - **Effortful to Effortless**
  - **Self-focused to Other-focused**
- **2) Attention Regulation**
  - **Stability, Control (flexible engagement)**
  - **Meta-awareness (de-centering & executive monitoring)**
- **3) Emotion Regulation**
  - **Equanimity,**
  - **Inhibitory control**
- **4) Extinction and Reconsolidation**
  - **Mental habits & biases shifted toward adaptive trajectories**
- **5) Prosociality**
  - **Empathy, Theory of Mind, & Altruistic Behavior**
- **6) Sensory Clarity**
  - **Embodied cognition**

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