

Compassion/Loving-kindness Meditation

Neurobiological Correlates

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Outline

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compassion meditation

- Conclusions

Compassion vs. Loving-kindness Meditation

- cultivate compassion, or deep, genuine sympathy for those stricken by misfortune, together with an earnest wish to ease this suffering (Hofmann, Grossman, & Hinton, 2011).
 - Karunaa in Pali (the language of the Buddha)
- Loving-kindness meditation (LKM) aims to develop an affective state of unconditional kindness to all people (Hofmann, Grossman, & Hinton, 2011).
 - Metta in Pali
- Often practiced together.

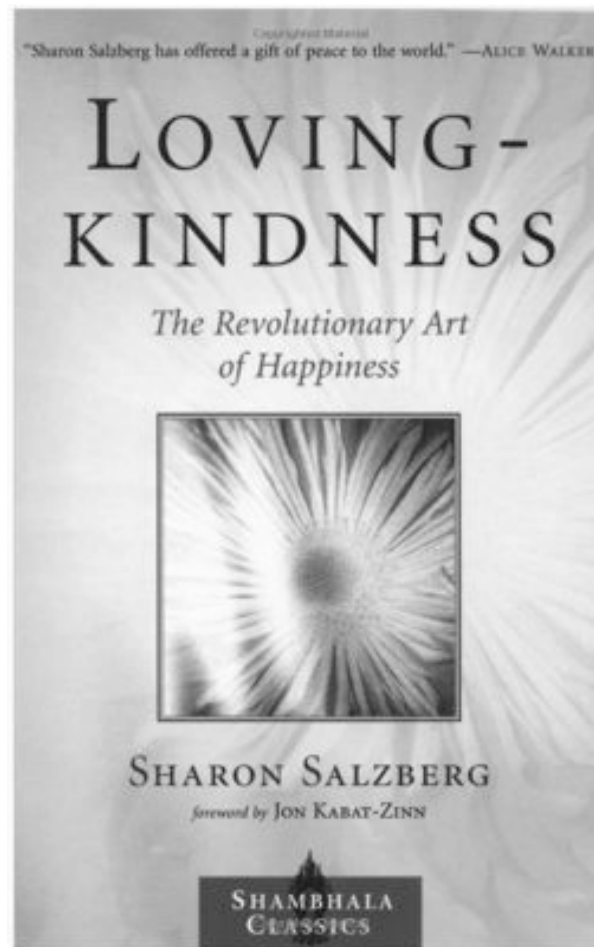


Compassion/loving-kindness meditation

- state in which an “... unconditional feeling of loving-kindness and compassion pervades the whole mind as a way of being, with no other consideration, or discursive thoughts” .
- The long-term goal of the practice is to enhance empathy for oneself and others and to inspire altruism.



Sharon Salzberg on Loving Kindness



<http://www.sharonsalzberg.com/>

Brief Exercise

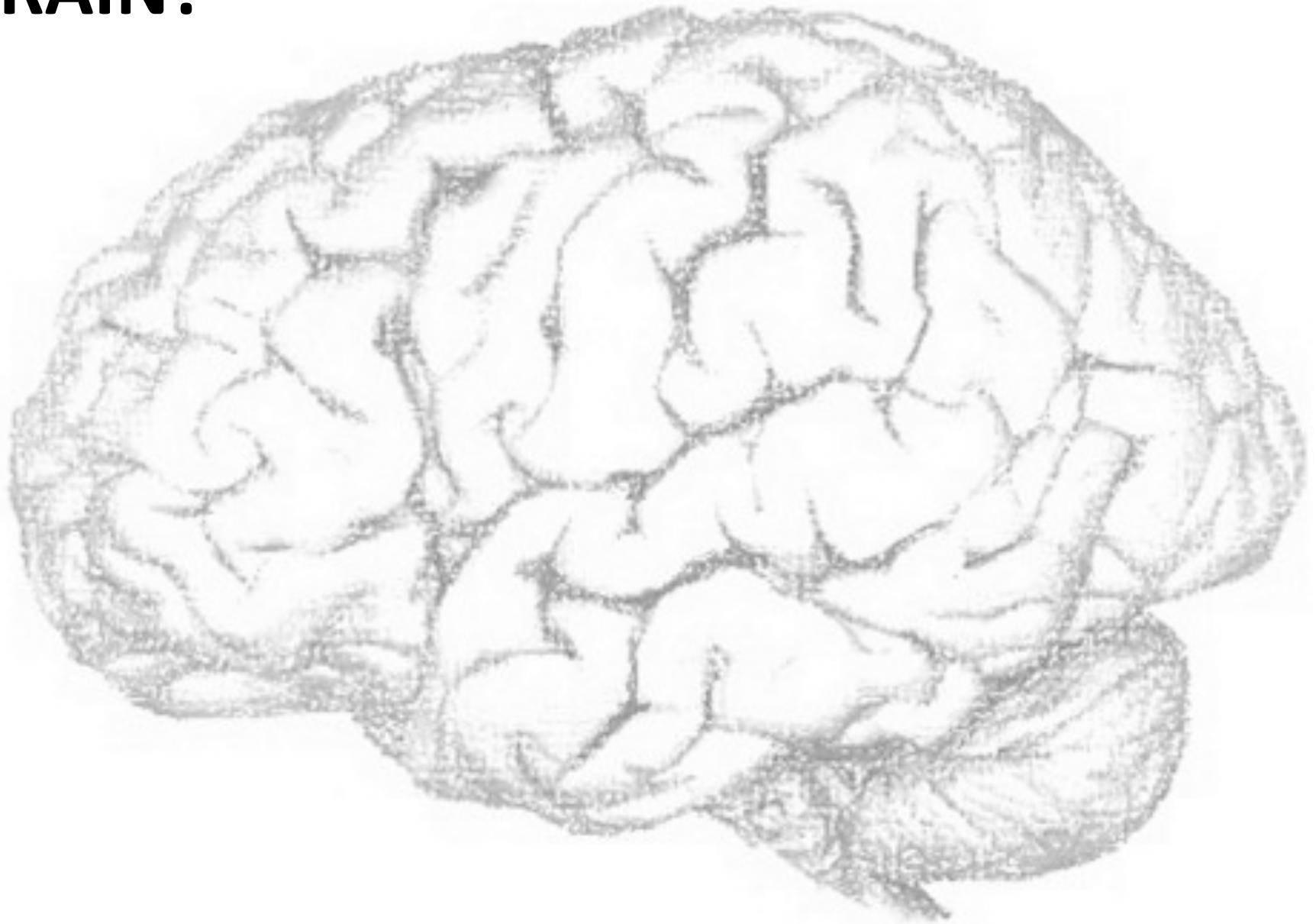
- Christopher K. Germer, PhD: recorded meditations that you can download can be found at:

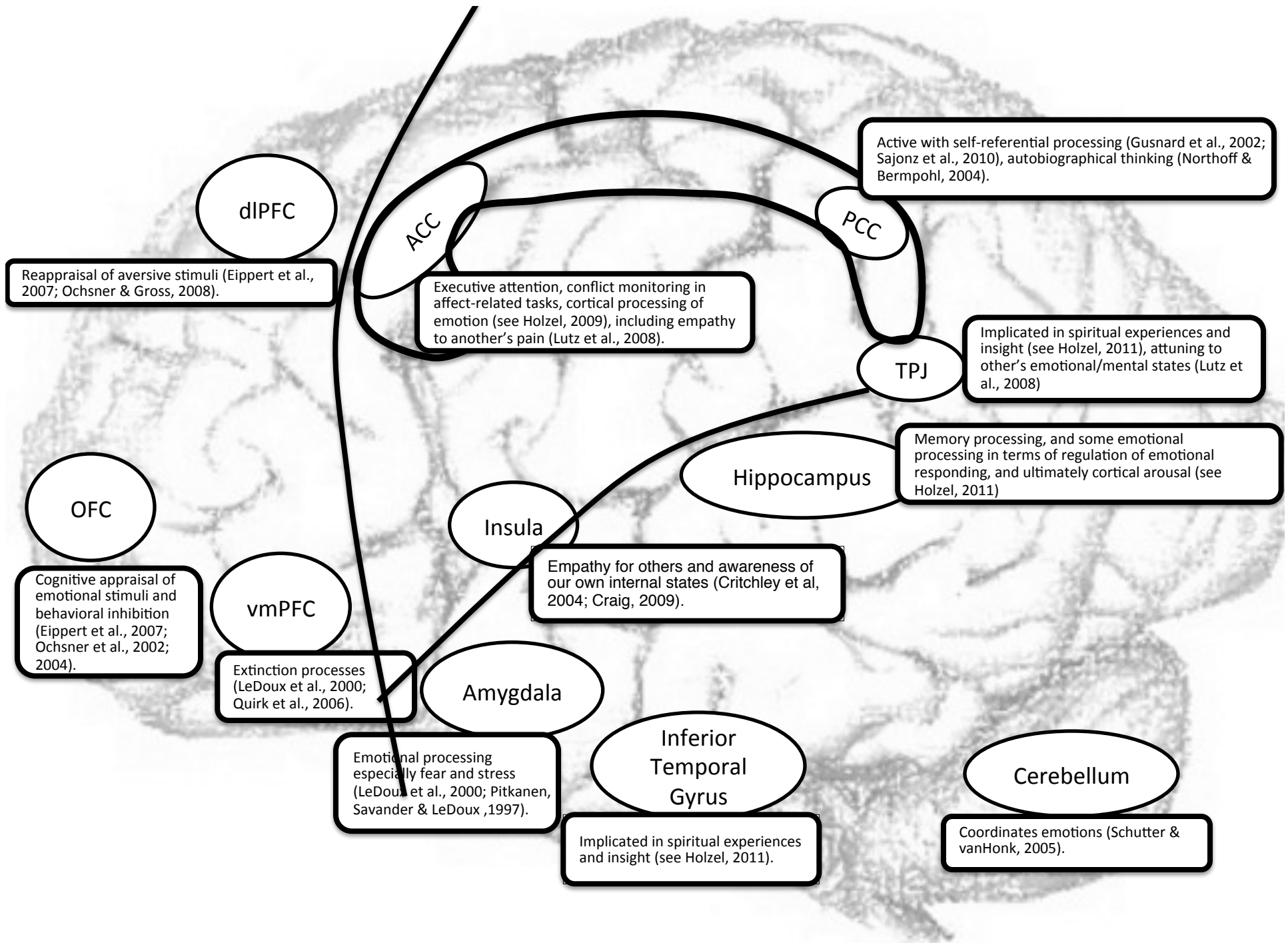
[http://www.mindfulselfcompassion.org/
meditations_selfcompassion.html](http://www.mindfulselfcompassion.org/meditations_selfcompassion.html)



10 minute exercise for beginners

WHAT IS HAPPENING IN THE “MINDFUL” BRAIN?





Sample study with MM

Norman Farb, Zindel Segal, et al. at the Univ. of Toronto used fMRI to study two aspects of self-awareness: the narrative “me” and the experiential “I”.

2 groups

1. Waitlist controls (novice)
2. MBSR grads (MT)

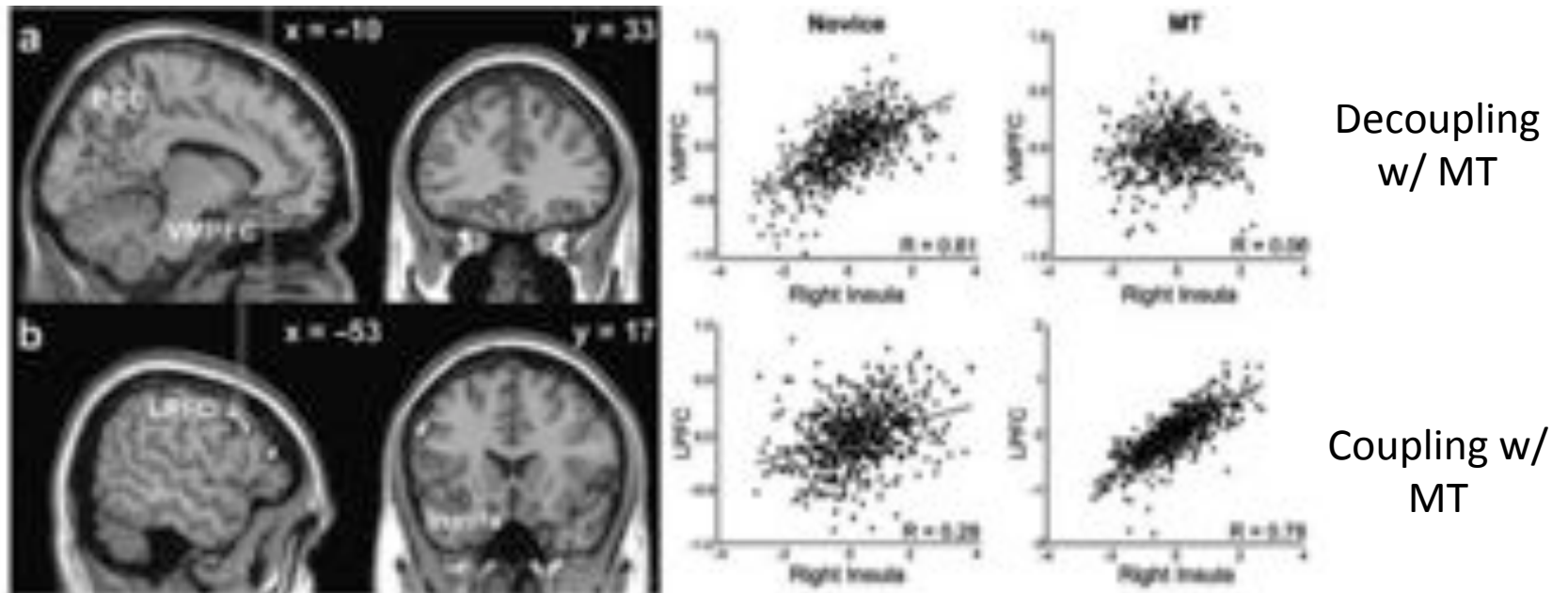
Trait-related adjective task in scanner:
charming – lively – hopeful – greedy – indecisive

Narrative Focus: “me” & my story

or

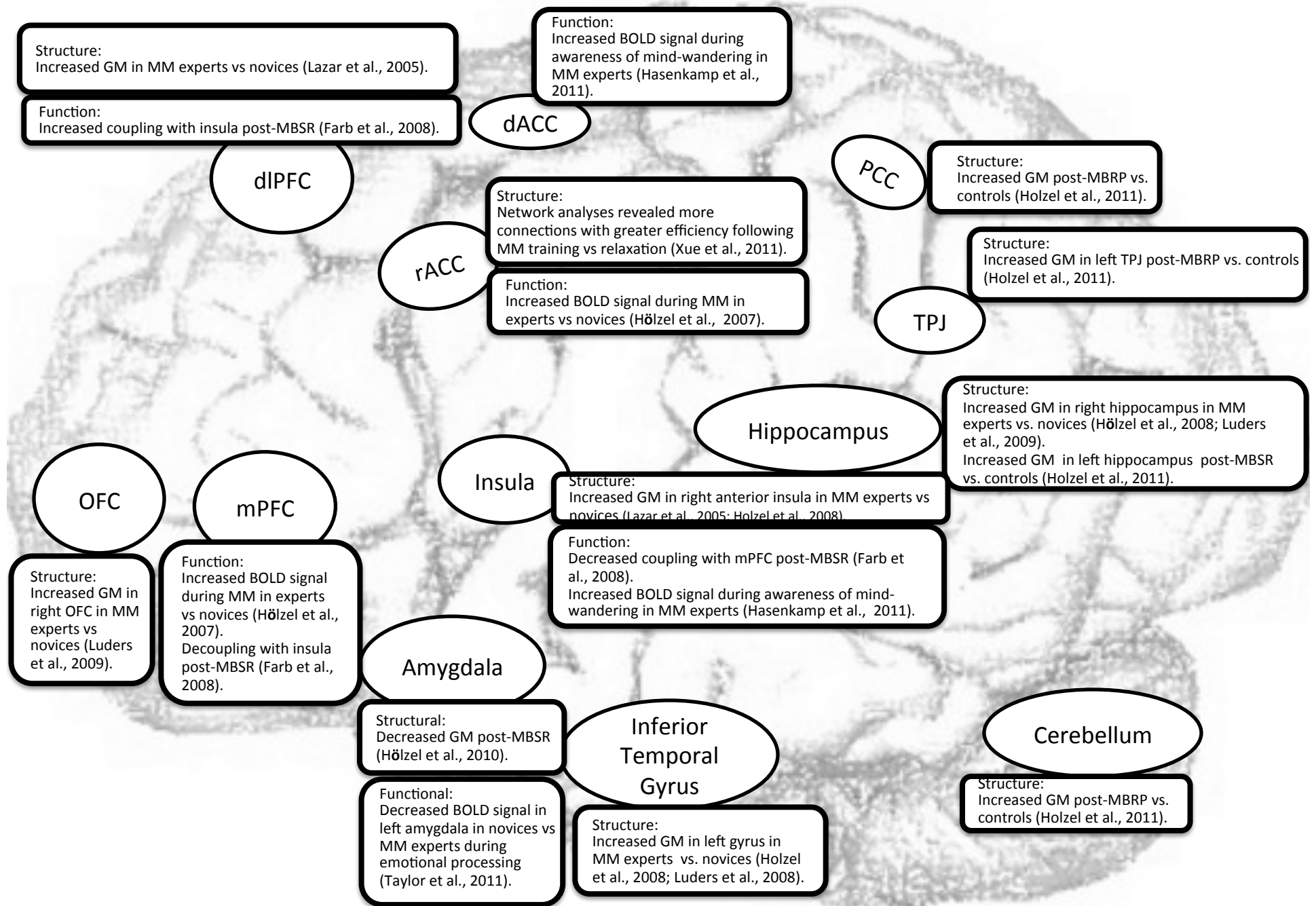
Experiential Focus: current moment “I” (mindful practice)

With EF:



Activity pattern associated with detached or objective modes of self-focus.

Farb et al. (2007). Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference. *SCAN*, 2, 313-322.



Sample study with LKM

Antoine Lutz et al., at U of Wisc. Madison studied fMRI responses during compassion meditation.

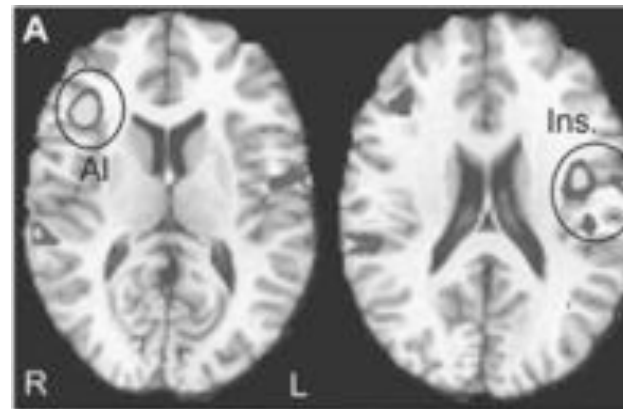
2 groups

1. Experts 10K+ hours
2. Novices w/ only 2-wk training period

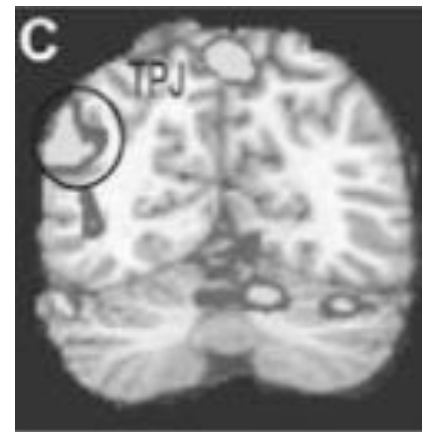
LKM
+
task in scanner



or

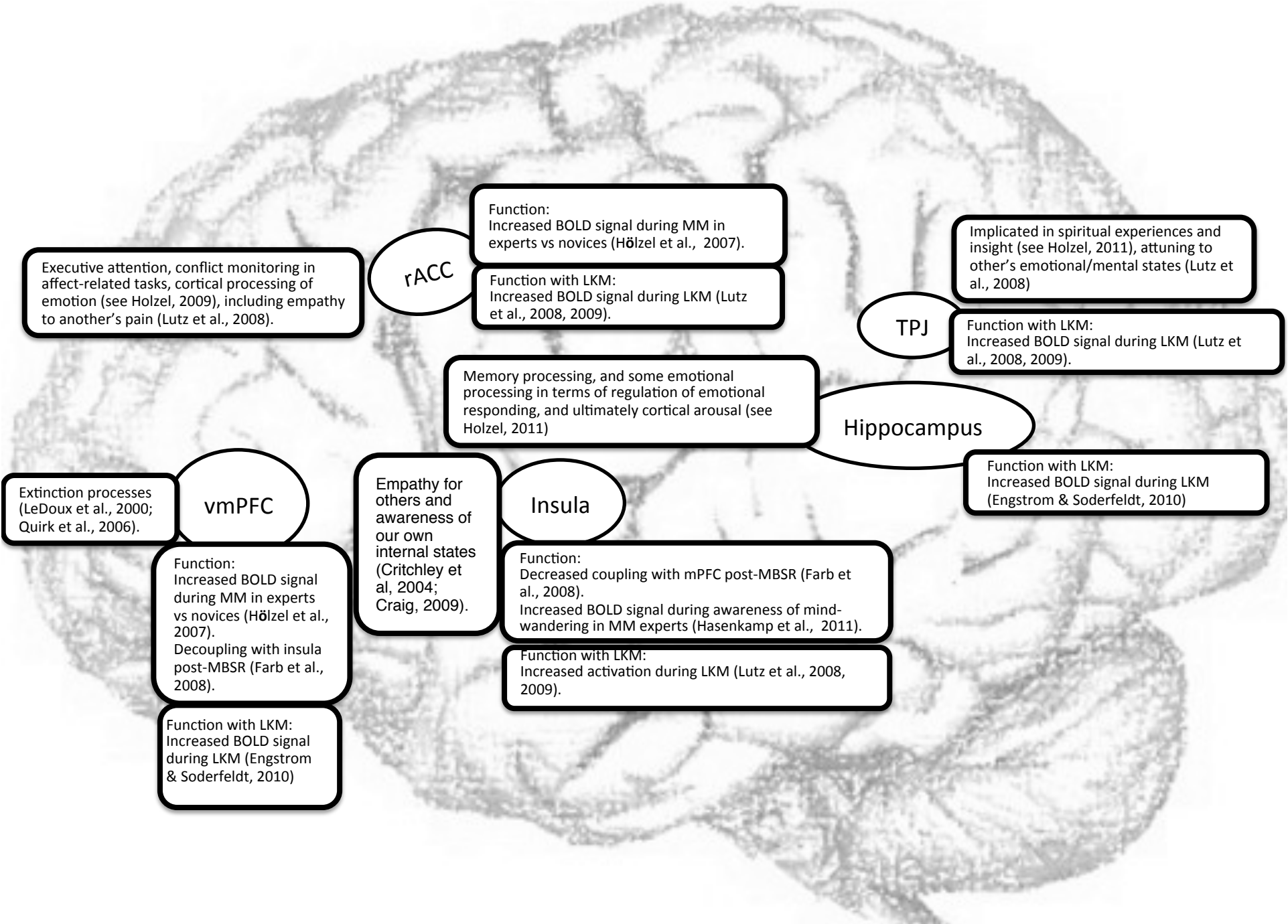


Greater increases in Insula (empathy) in experts.



Greater increases in temporal-parietal junction (TPJ; spiritual, attuning) in experts.

Source: Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PLOS One*, 3, 1-10.



Executive attention, conflict monitoring in affect-related tasks, cortical processing of emotion (see Holzel, 2009), including empathy to another's pain (Lutz et al., 2008).

rACC

Function:
Increased BOLD signal during MM in experts vs novices (Hölzel et al., 2007).

Function with LKM:
Increased BOLD signal during LKM (Lutz et al., 2008, 2009).

Implicated in spiritual experiences and insight (see Holzel, 2011), attuning to other's emotional/mental states (Lutz et al., 2008)

TPJ

Function with LKM:
Increased BOLD signal during LKM (Lutz et al., 2008, 2009).

Memory processing, and some emotional processing in terms of regulation of emotional responding, and ultimately cortical arousal (see Holzel, 2011)

Hippocampus

Function with LKM:
Increased BOLD signal during LKM (Engstrom & Soderfeldt, 2010)

Extinction processes (LeDoux et al., 2000; Quirk et al., 2006).

vmPFC

Empathy for others and awareness of our own internal states (Critchley et al, 2004; Craig, 2009).

Insula

Function:
Decreased coupling with mPFC post-MBSR (Farb et al., 2008).
Increased BOLD signal during awareness of mind-wandering in MM experts (Hasenkamp et al., 2011).

Function with LKM:
Increased activation during LKM (Lutz et al., 2008, 2009).

Function:
Increased BOLD signal during MM in experts vs novices (Hölzel et al., 2007).
Decoupling with insula post-MBSR (Farb et al., 2008).

Function with LKM:
Increased BOLD signal during LKM (Engstrom & Soderfeldt, 2010)

Conclusions

- With LKM we see less widespread neural activity.
- No structural data with LKM is currently available.
- There is focused activity in the insula
 - Empathy
 - Feeling states
- There is focused activity in the vmPFC w/o decoupling with the insula
 - Can inhibit conditioned learning associated with internal states
 -
 -
- TPJ activity
 - attunement
 - “spiritual experience”
- Hippocampal activity may lead to processing of more favorable memories.

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Future Directions

- Medline 10/27/2011: Only 8 published studies on LKM.





Thank you