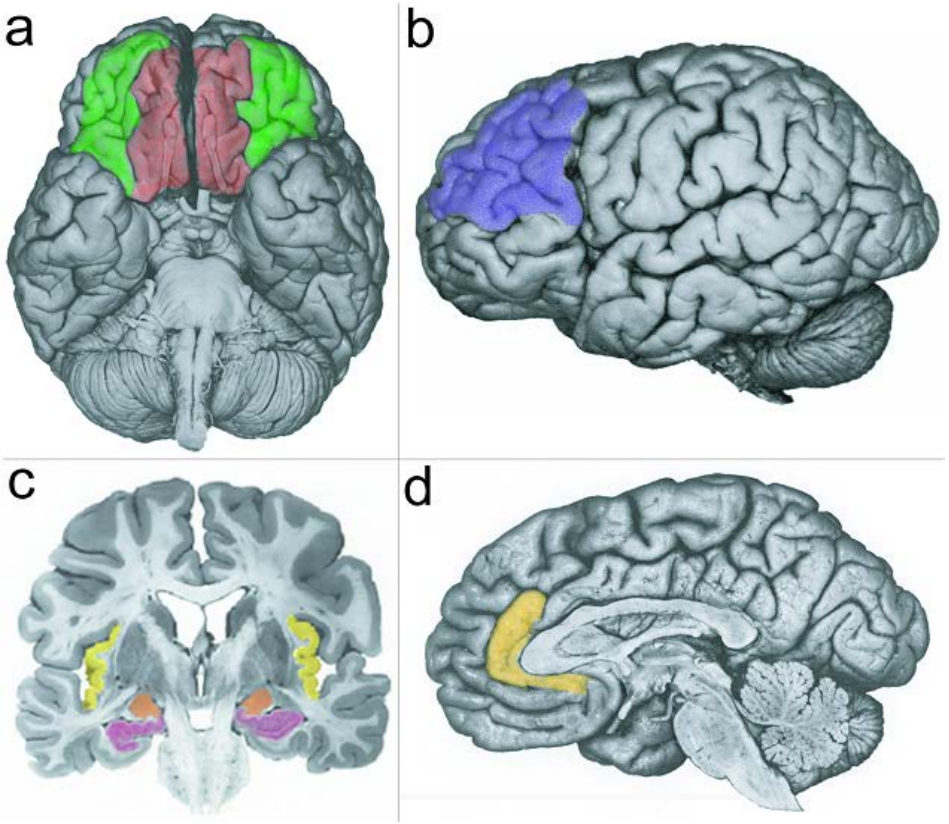
Therapeutic Learning in Depression

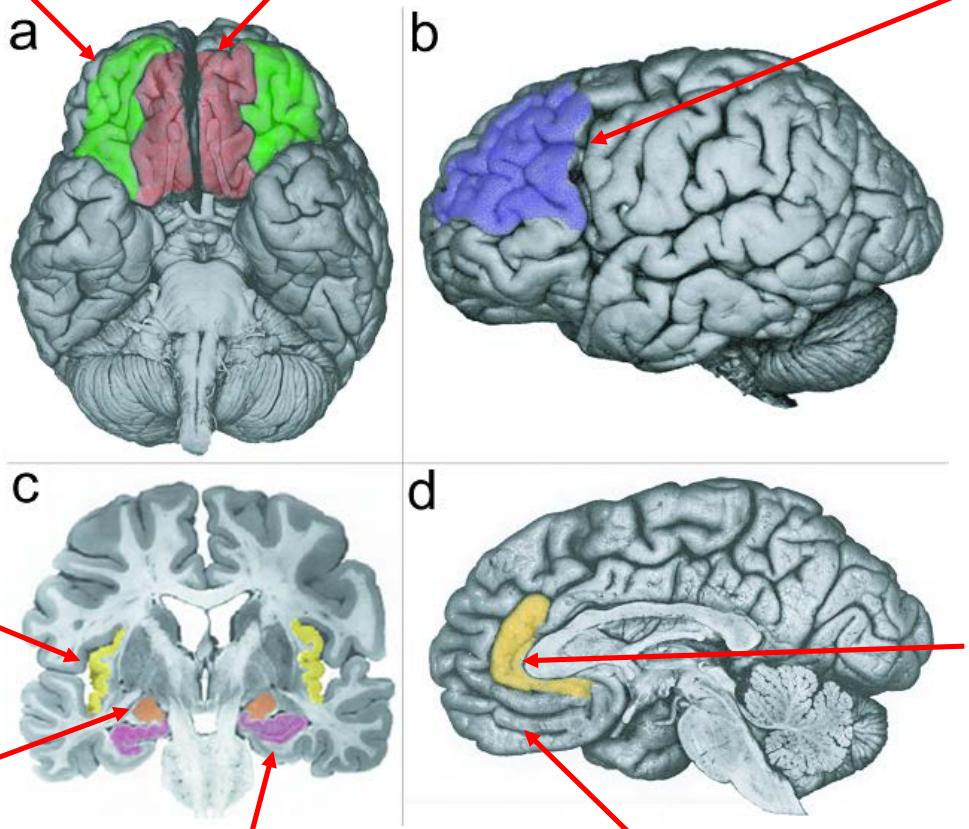
- Emotional cognition
- Neural circuitry of depression-related cognition
- Example:

  Plasticity within prefrontal-amygdala circuitry

Neuroanatomy Quiz



Neuroanatomy Quiz



Ventromedial PFC

Orbitofrontal cortex

Dorsolateral PFC

Insula

Anterior cingulate cortex

Amygdala

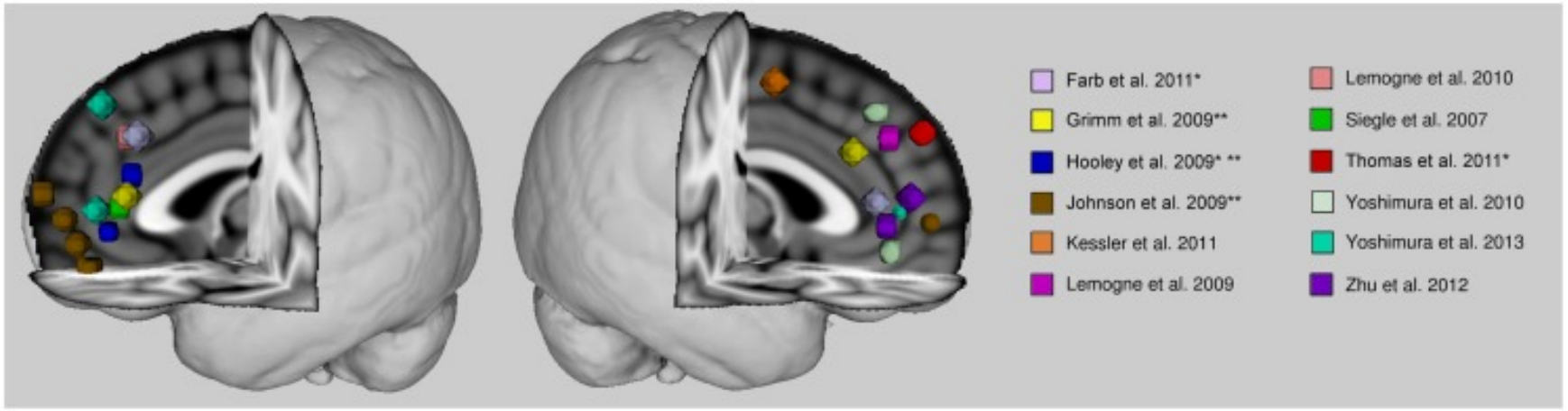
Hippocampus

Ventromedial PFC

Emotional Cognition in Depression

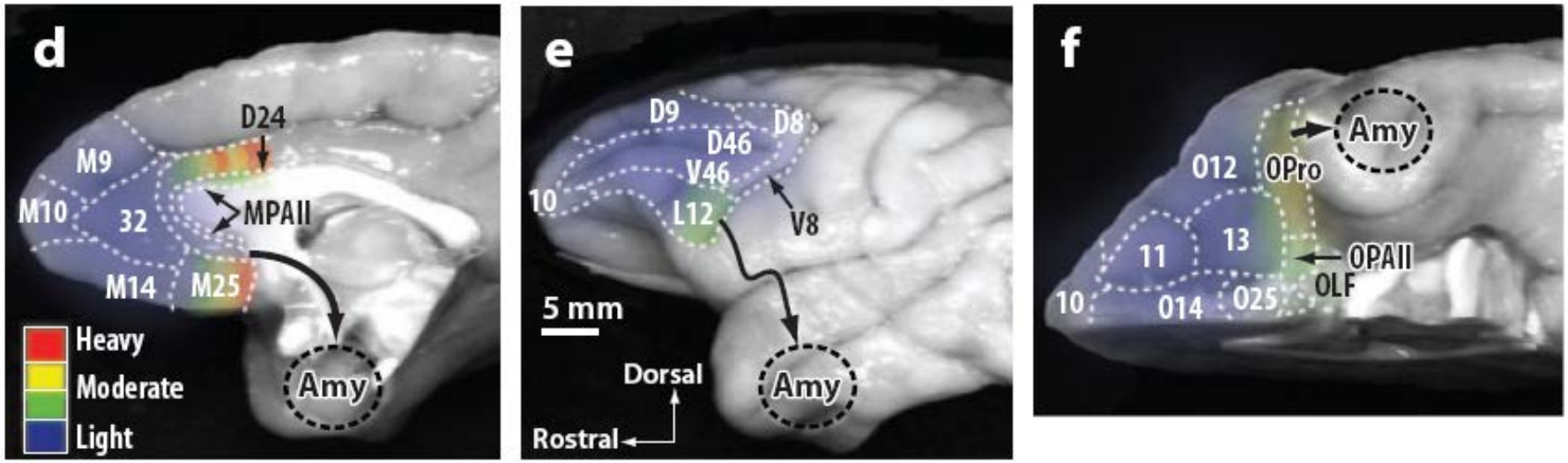
- Negative self-focused thought
- Rumination
- Difficulty with cognitive reappraisal & emotion regulation
- Mood-congruent cognitive bias
  - Interpretation bias
  - Memory bias

self-related processing and anterior cortical midline in depression



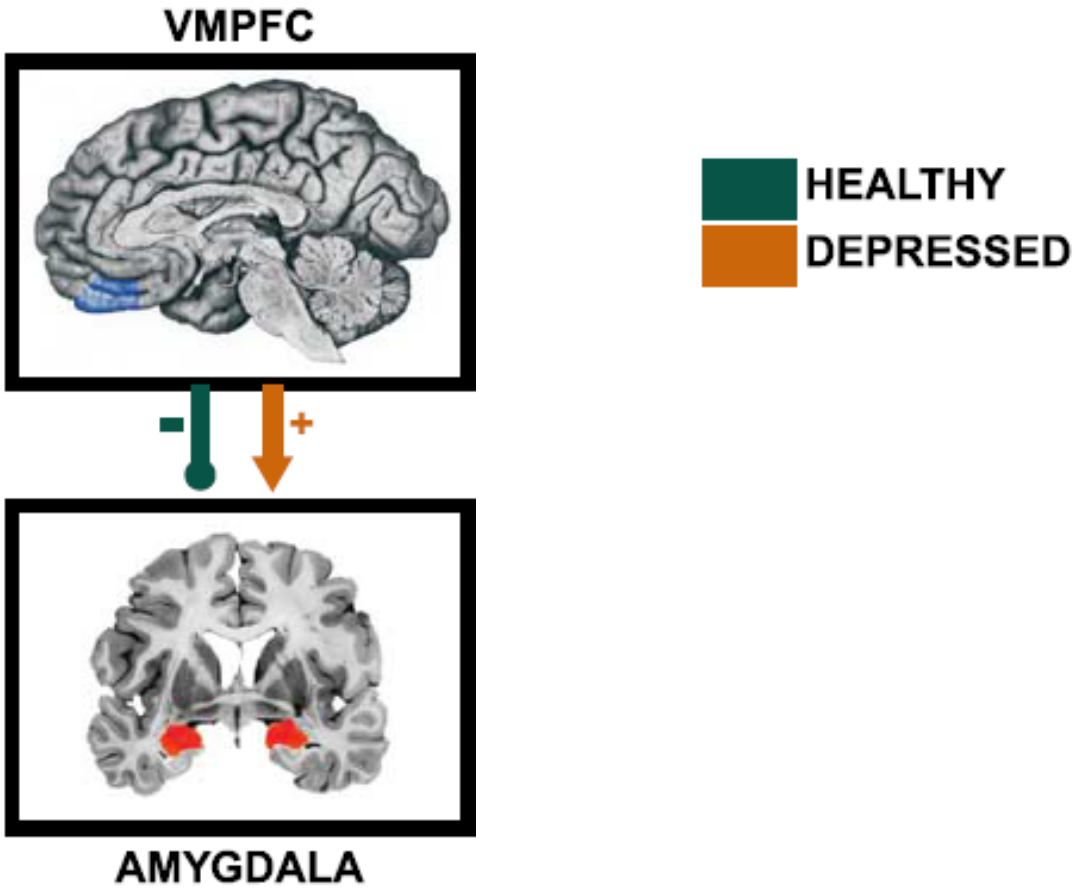
Nejad, Fossati, & Lemogne (2013) Front Hum Neurosci.

Anatomical projections from PFC to amygdala in rhesus monkeys



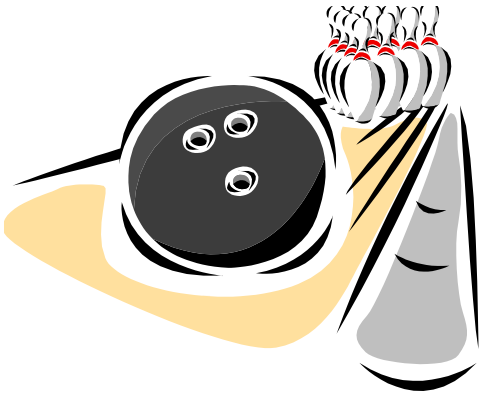
Ghashghaei, HT (2007) Neuroimage.
Also see Salzman & Fusi (2010) Annual Review Neurosci.

Loosening of regulatory control of PFC over amygdala



Johnstone et al. (2007) *J Neuroscience*.

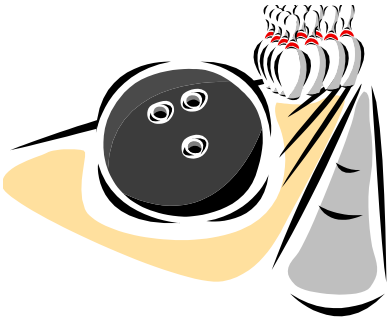
Metaphors for plasticity: The mental gutter



THIS WAS THE SECOND GIRL WHO TURNED ME DOWN. I WILL NEVER SUCCEED IN FINDING A GIRL!

Psychotherapeutic Learning: Practice & Repetition

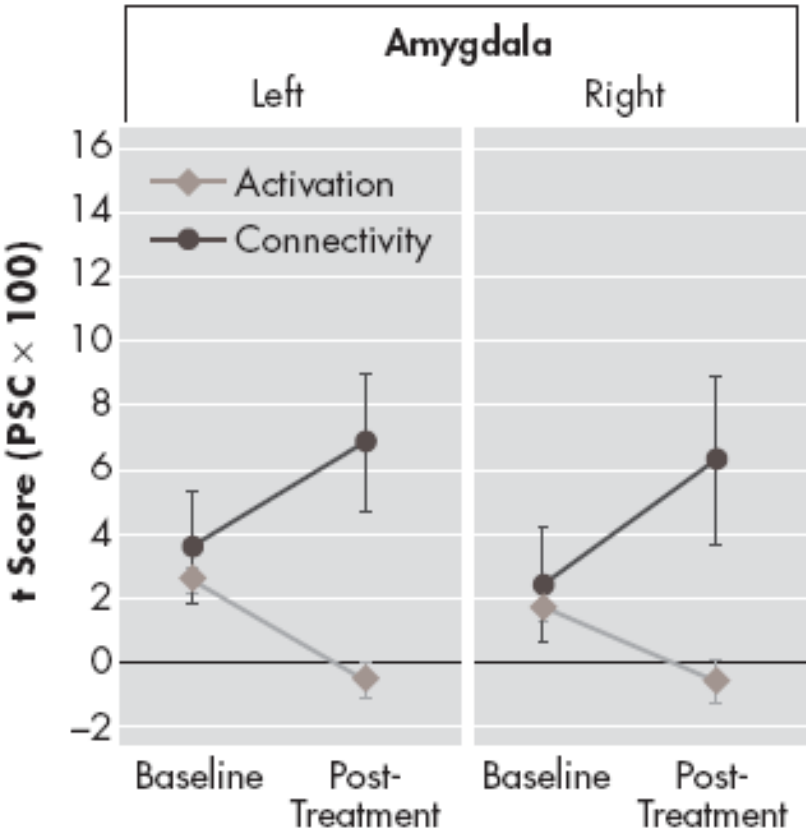
- *1. **No**tice habitual automatic thought*
- *2. **Va**lidation of self for noticing*
- *(3. Apply new skill)*



Changing mental habits requires PRACTICE

- Insight alone is only somewhat useful
- Psychotherapeutic learning requires repeated practice
  - Awareness of automatic or involuntary mental states
  - New behaviors and cognitions

Increase in PFC-amygdala functional connectivity with 6 wks sertraline

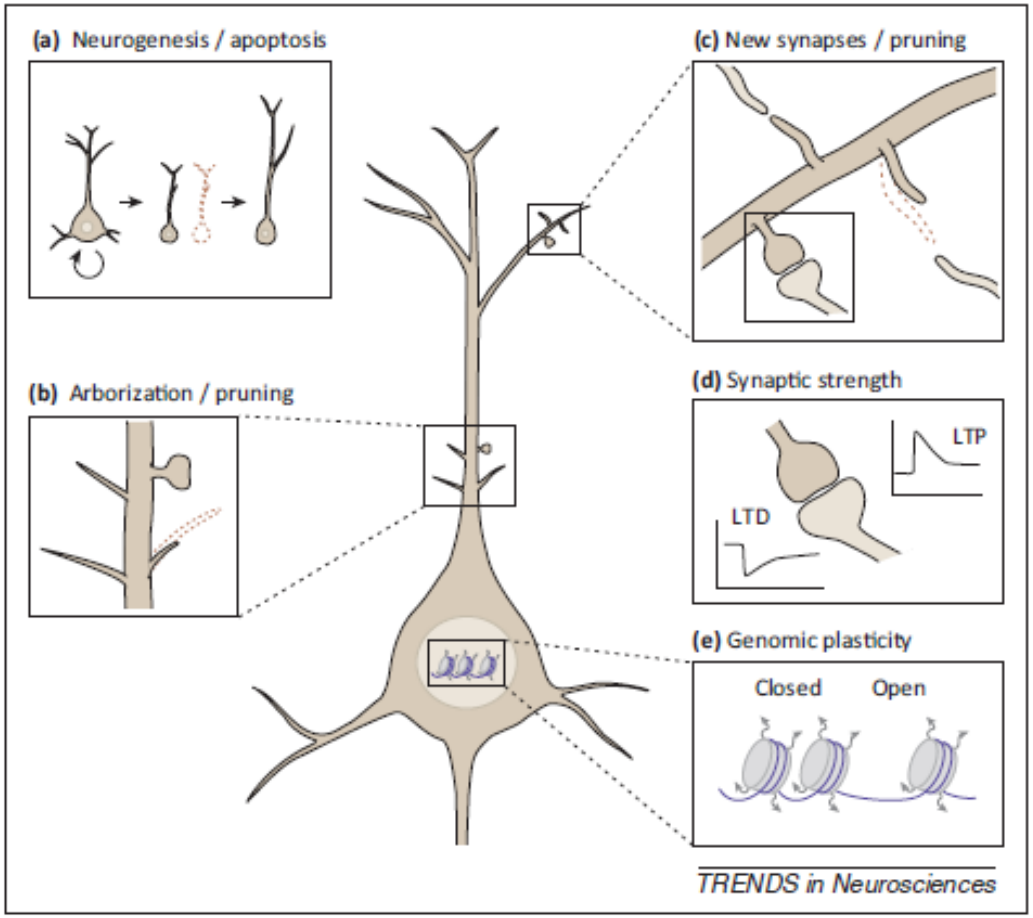


Anand, et al. (2007) *J Neuropsychiatry & Clin Neurosci*.

Treatment modalities for depression stimulate neuroplastic mechanisms

- Psychotherapy
- Antidepressant medications
- Somatic & neuromodulatory techniques
  - electroconvulsive therapy
  - deep brain stimulation
- Other
  - physical exercise
  - omega 3 fatty acids

Antidepressants alter many neuroplastic mechanisms that underlie “cells that fire together wire together”



From Castren & Hen (2013) *Trends in Neurosciences*.

Therapeutic learning in depression

- Effective treatments for depression stimulate neuroplastic mechanisms that support learning

- Biologically-informed behavioral interventions
  - Promote therapeutic learning
  - “Sculpt” neural circuits
  - Importance of practice and repetition