

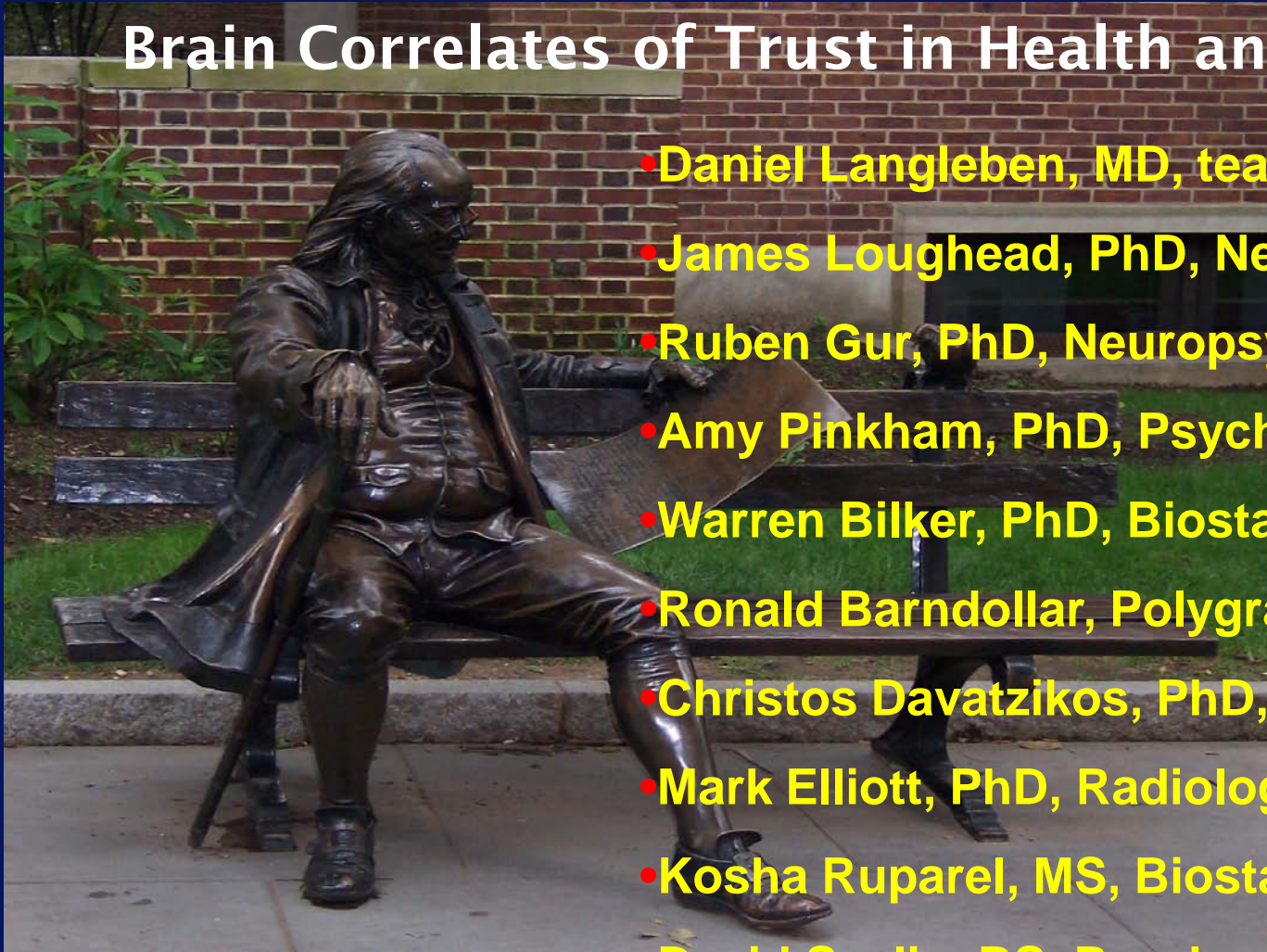


# University of Pennsylvania



## Brain Correlates of Trust in Health and Disease

- Daniel Langleben, MD, team leader
- James Loughhead, PhD, Neuropsychology
- Ruben Gur, PhD, Neuropsychiatry
- Amy Pinkham, PhD, Psychology
- Warren Bilker, PhD, Biostatistics
- Ronald Barndollar, Polygraph Examiner
- Christos Davatzikos, PhD, Biostatistics
- Mark Elliott, PhD, Radiological Physics
- Kosha Ruparel, MS, Biostatistics
- David Seelig, BS, Psychophysiology
- Melanie L. Glocker, PhD, Ethology



# University of Pennsylvania School of Medicine Team

## Proven record of reducing neuroscience research to practice

- **Defining problems in systems neuroscience, such as deception (Langleben et al 2002,2005), fear (Gur et al numerous articles), attraction (Glocker et al 2009) and trustworthiness appraisal (Pinkham et al 2005)**
- **Operationalizing such problems by reducing them to testable hypotheses**
- **Implementing exploratory proof of concept and feasibility studies utilizing a range of brain imaging, behavioral and genetic techniques**
- **Developing and applying novel statistical approaches for imaging data analyses (Davatzikos et al 2005, many others)**

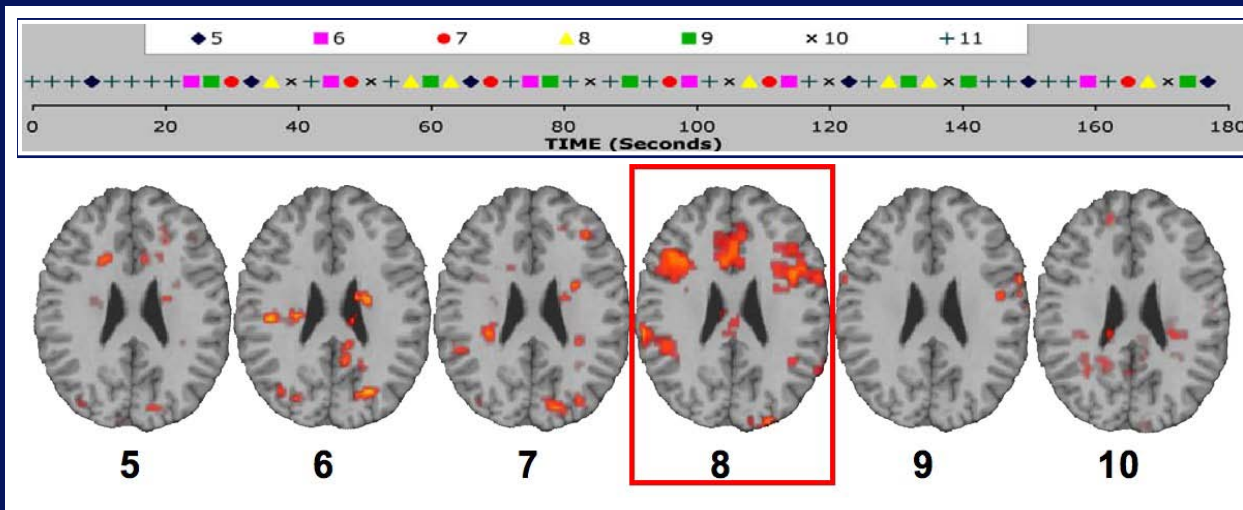
# Critical Requirements of Translational Research

- Ecologically valid experimental paradigms
- Single-subject feasibility
- Selecting measurement technology appropriate for the behavioral phenomenon of interest

## Most Trust Variables Stem from Brain Activity

- Central Nervous System (Brain): functional MRI, O-15 PET, NIRS
- Peripheral Nervous System (Skin/Surface): Observation, Psychophysiology (Polygraph), Eye-tracking, Eye Blink Rate, Cardiac Rate Variability, Thermal Imaging
- Functional assessment of personality states and traits: interactive strategy “games”
- Psychological assessments of personality traits: MMPI, PAI.
- Pharmacological and Molecular: Peripheral blood and CSF assays and genetic analyses

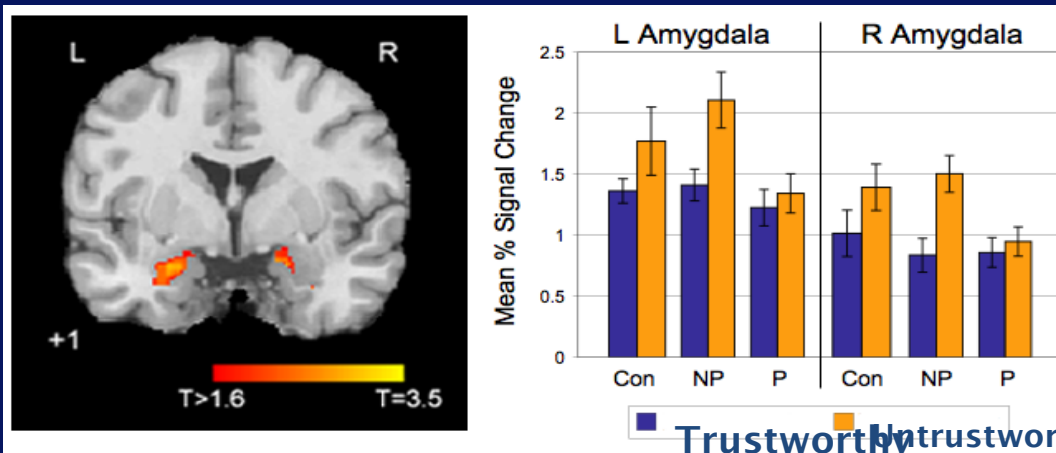
# Brain imaging of deception (betrayal of trust)



Lie vs. Unknown

(Adapted from Langleben et al 2005)

# Brain imaging of trustworthiness appraisal



Normal vs. Paranoid

(Adapted from Pinkham et al 2008)

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