Are Neuroassessments the Next Disruptive Innovation in the Testing Industry?

An ATP Cross-Functional Brainstorm

#EATPconf

Moderator

- Gary Behrens, Director, *General Dynamics IT*

Participants

- Manny Straehle, President and Founder, *Assessment, Education, and Research Experts*
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EUROPE ATP 2016
Lisbon, Portugal
Potential Neuroassesment Disruptions to Competency and Clinical Assessment
Manny Straehle, Assessment, Education & Research Experts
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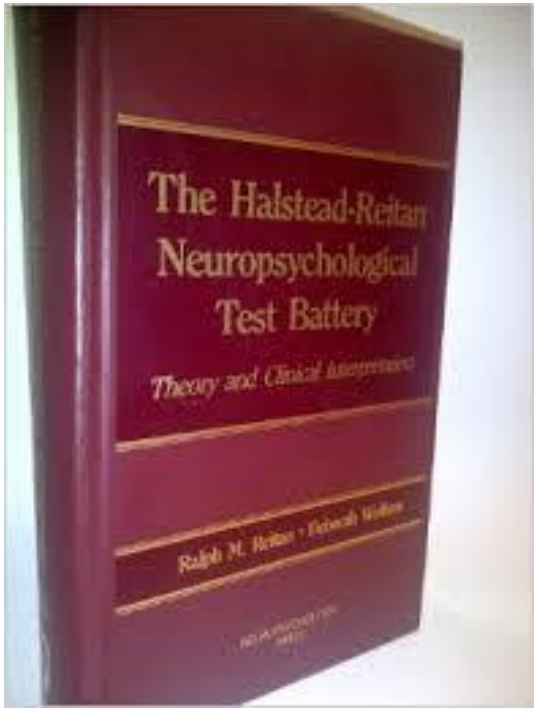
Current Neuroassessments

- Clinical
- Imaging
- Eye Tracking
- Hormonal
- EEG and related devices
- Interviewing
- History Taking
- Standardized testing



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Potential Neuroassessment Disruptions

Certification/Licensure

Can we use neuroassessments for competency testing?

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Cache Cab: Taxi Drivers' Brains Grow to Navigate London's Streets

Memorizing 25,000 city streets balloons the hippocampus, but cabbies may pay a hidden fare in cognitive skills

By Ferris Jabr on December 8, 2011 3

Wikimedia Commons

Manhattan's midtown streets are arranged in a user-friendly grid. In Paris 20 administrative districts, or arrondissements, form a clockwise spiral around the Seine. But London? A map of its streets looks more like a tangle of yarn that a preschooler glued to construction paper than a metropolis designed with architectural foresight. Yet London's taxi drivers navigate the smoggy snarl with ease, instantaneously calculating the swiftest route between any two points.

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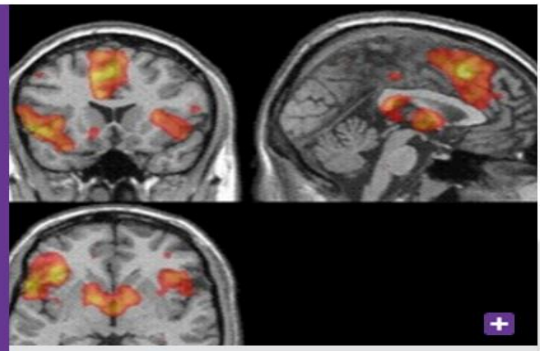
The Problem with Female Superheroes

Test Security

Deception testing using eye tracking, hormonal, and/or imaging

Spot the liar?

Controversially, certain brain scanning techniques such as fMRI and EEG have been used for lie-detection purposes in high-profile court cases in the US and India since 2008. Although fMRI for lie detection is an as-yet unproven technology, scientist Steve Laken says the basic idea behind using fMRI for lie detection is that when you tell the truth, 'the brain moves relatively fast. You simply don't have to think about things. To lie, however, you have to first understand the question and then come up with an alternative communication.' The differences in how the brain behaves when people lie and tell the truth are visible in fMRI scans.



This fMRI scan shows the areas of the brain active when you tell a lie.

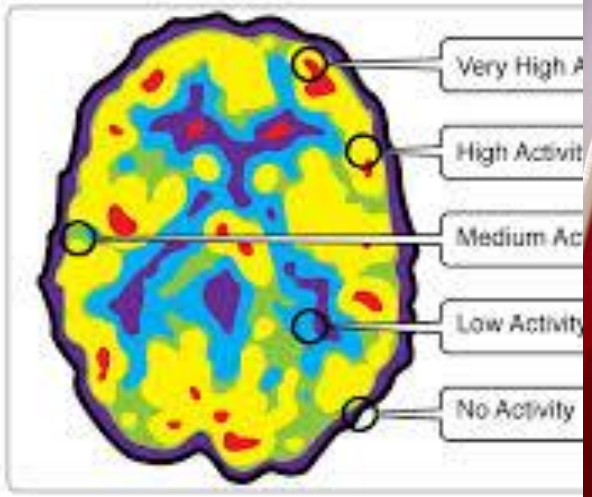
Disruptive Neuroassessments: Issues

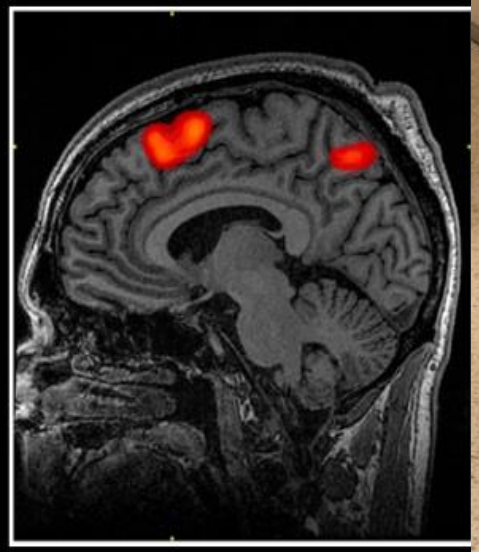
- Brain measurements are not always accurate
- Bioethics
- Expensive
  - Tools or "Braingear" are becoming more portable and cheaper

CT SCAN
&
MRI / fMRI

PET SCAN

EEG





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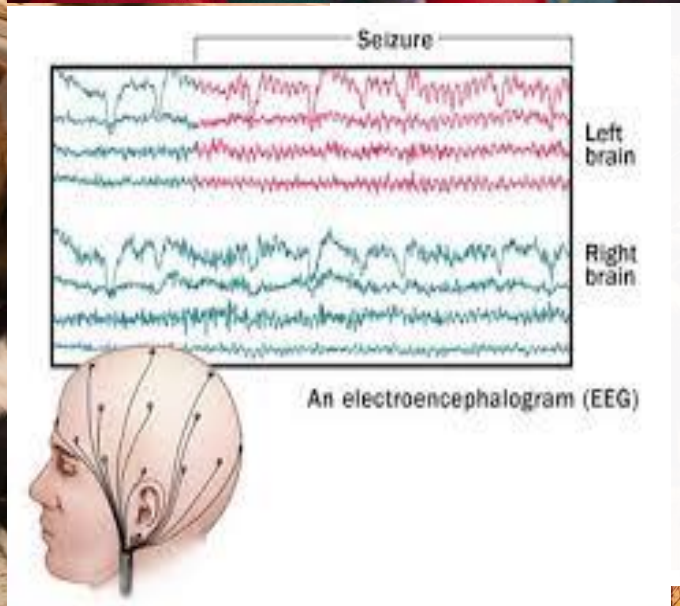
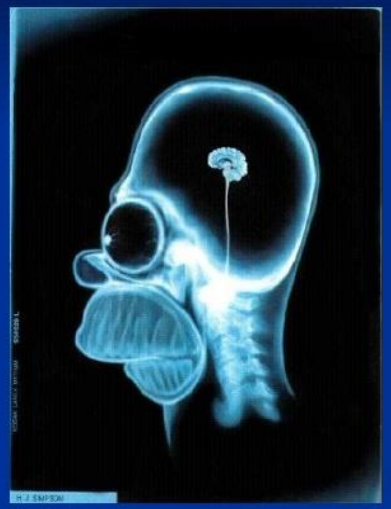
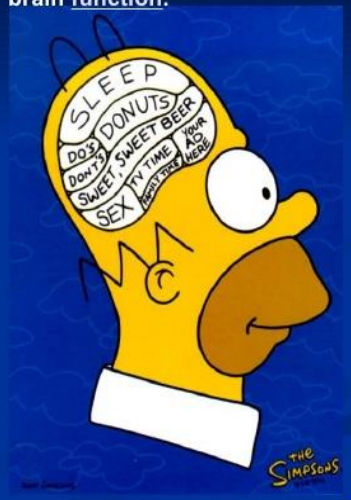


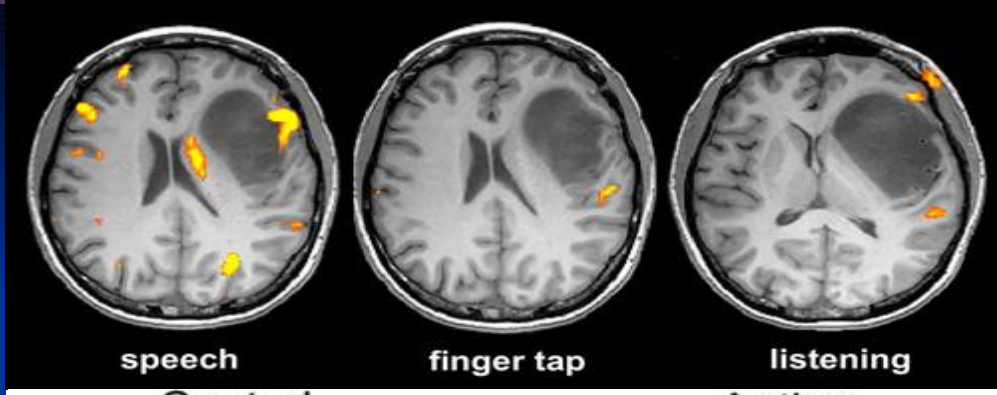
MRI vs. fMRI

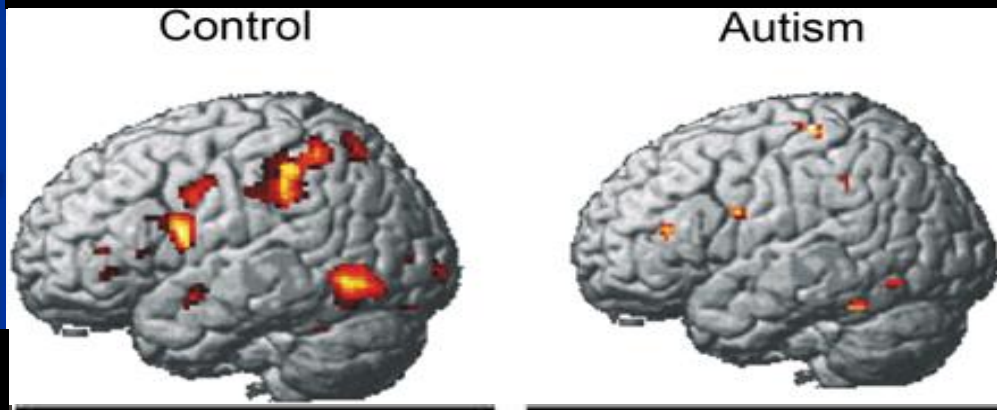
MRI studies brain anatomy.

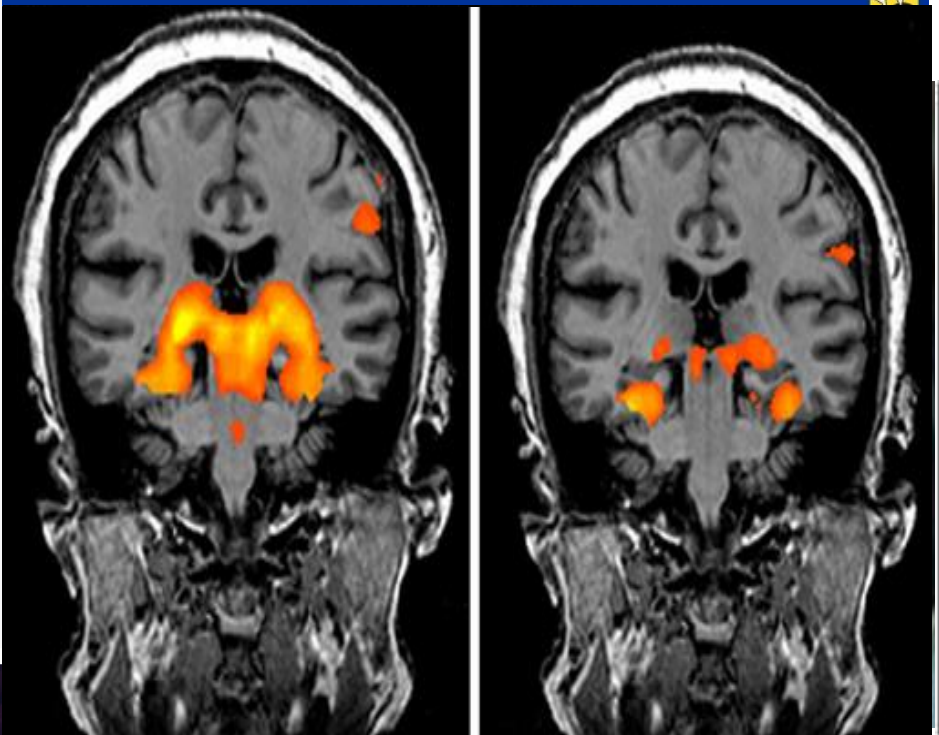


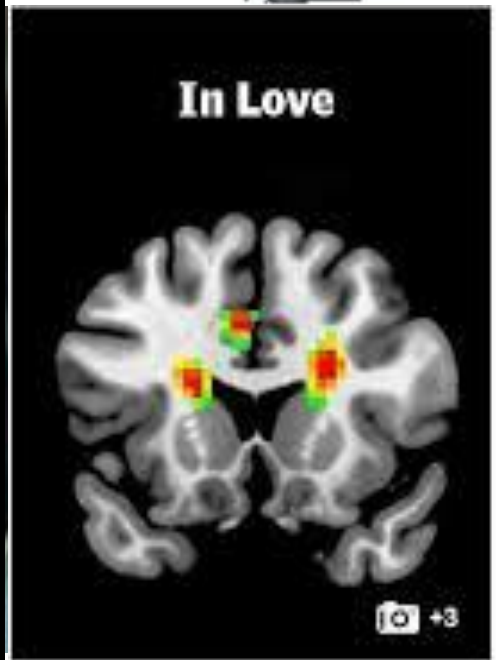
Functional MRI (fMRI) studies brain function.



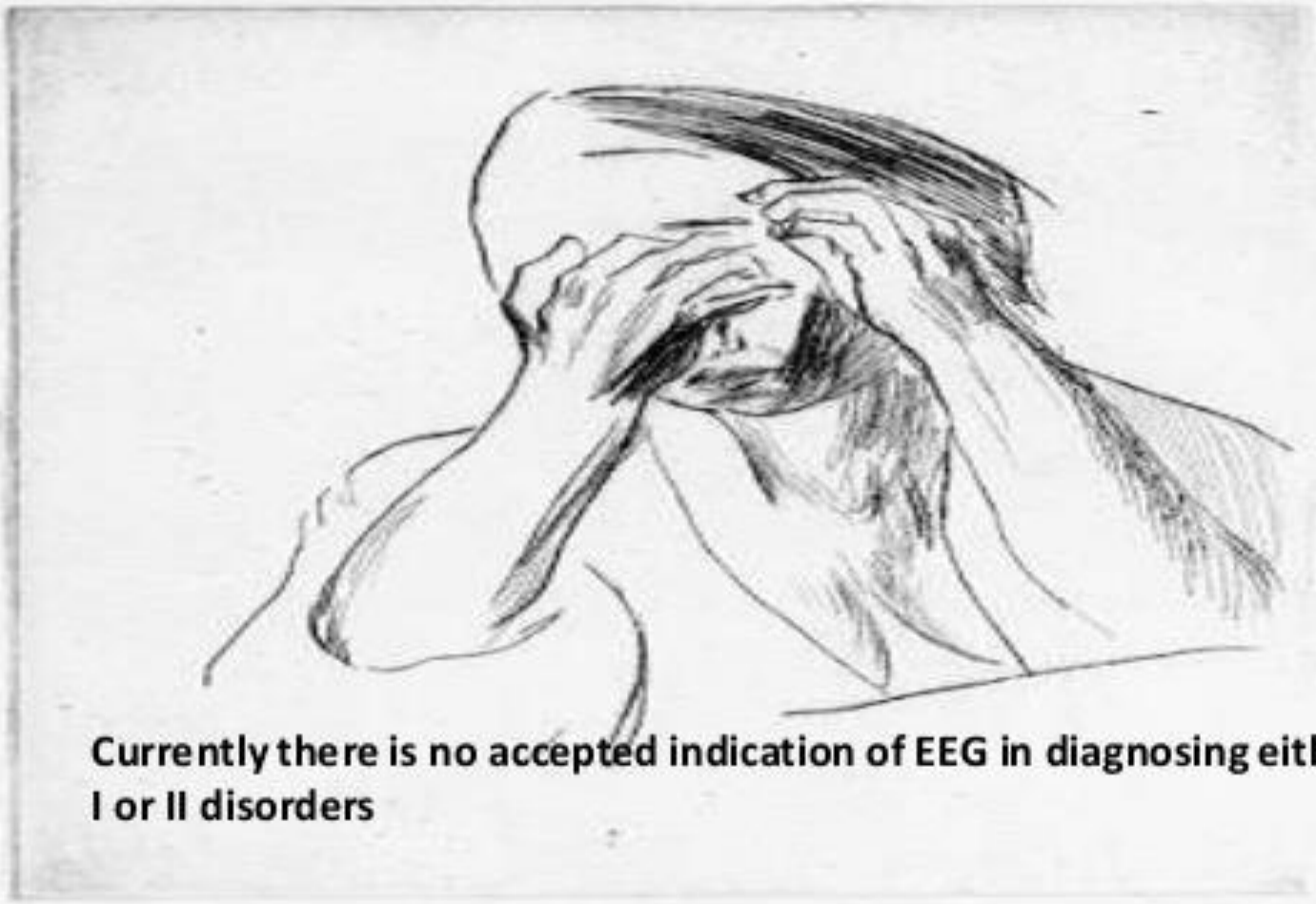








EEG IN PSYCHIATRIC DISORDERS



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Current State of Neuroimaging Scans for Questions Related to Behavior and Mental Health

What Brain Scans Can Do	What Brain Scans Cannot Do
❑ Study healthy brain development	❑ Diagnose a mental illness condition when used by themselves
❑ Study effects of mental illness or mental health treatments on the brain	❑ Predict risk of getting a mental illness
❑ Confirm a diagnosis of a few disorders (e.g., tumor that is affecting behavior)	❑ Determine what medications/ treatments work the best
❑ In conjunction with other tests, help establish the right diagnosis for mood & behavior problems	❑ Predict individual brain - behavior relationships with accuracy

Courtesy of Mark Ledbetter - Houghton, Mifflin, Harcourt


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Education, Learning, and Neuroscience
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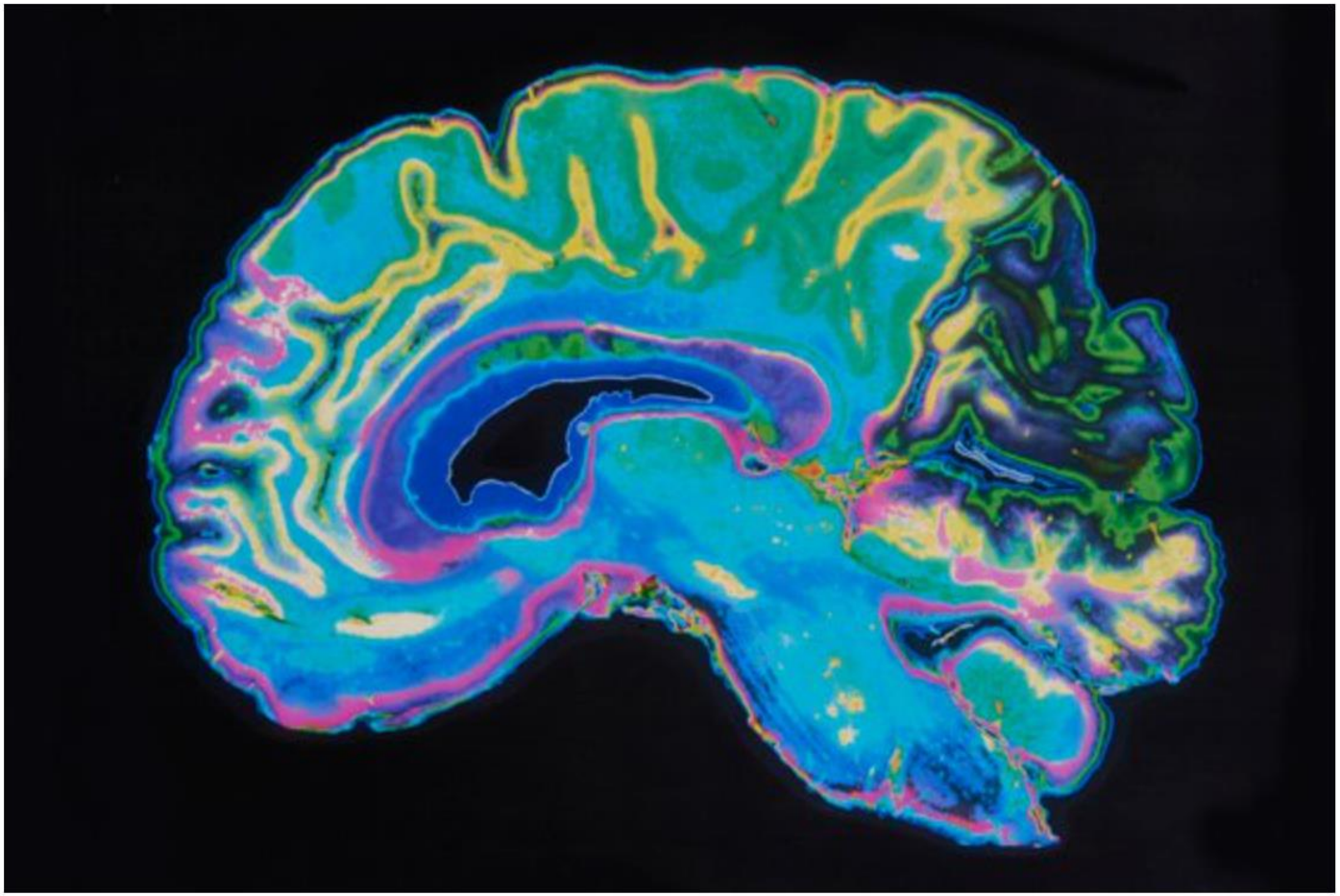
Education, Learning, & Neuroscience

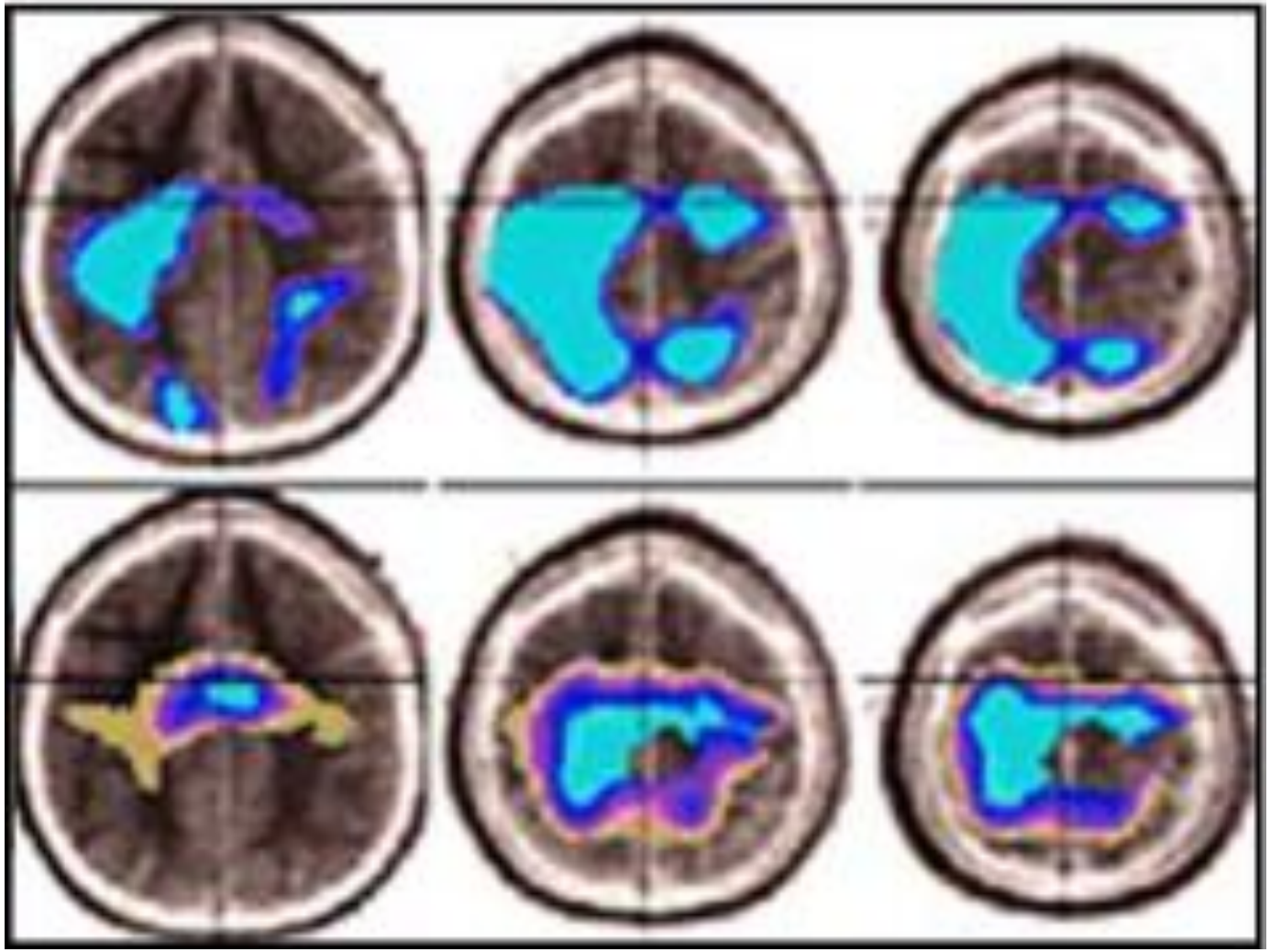
- The brain is static, unchanging, and set before you start school.
- Some people are left-brained and some are right-brained.
- We use only 10 percent of our brains.
- Male and female brains are radically different.

What Students Are Thinking

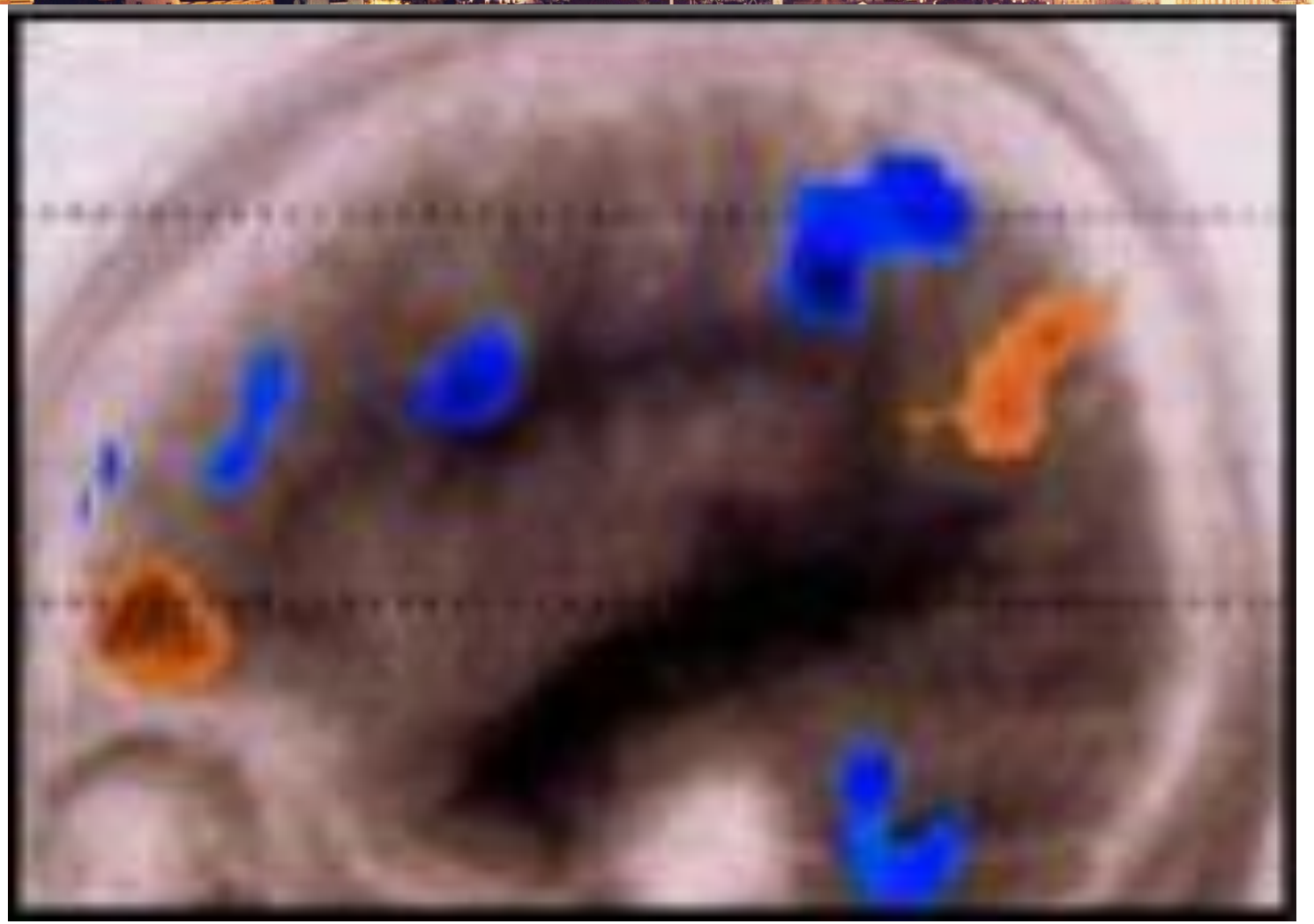


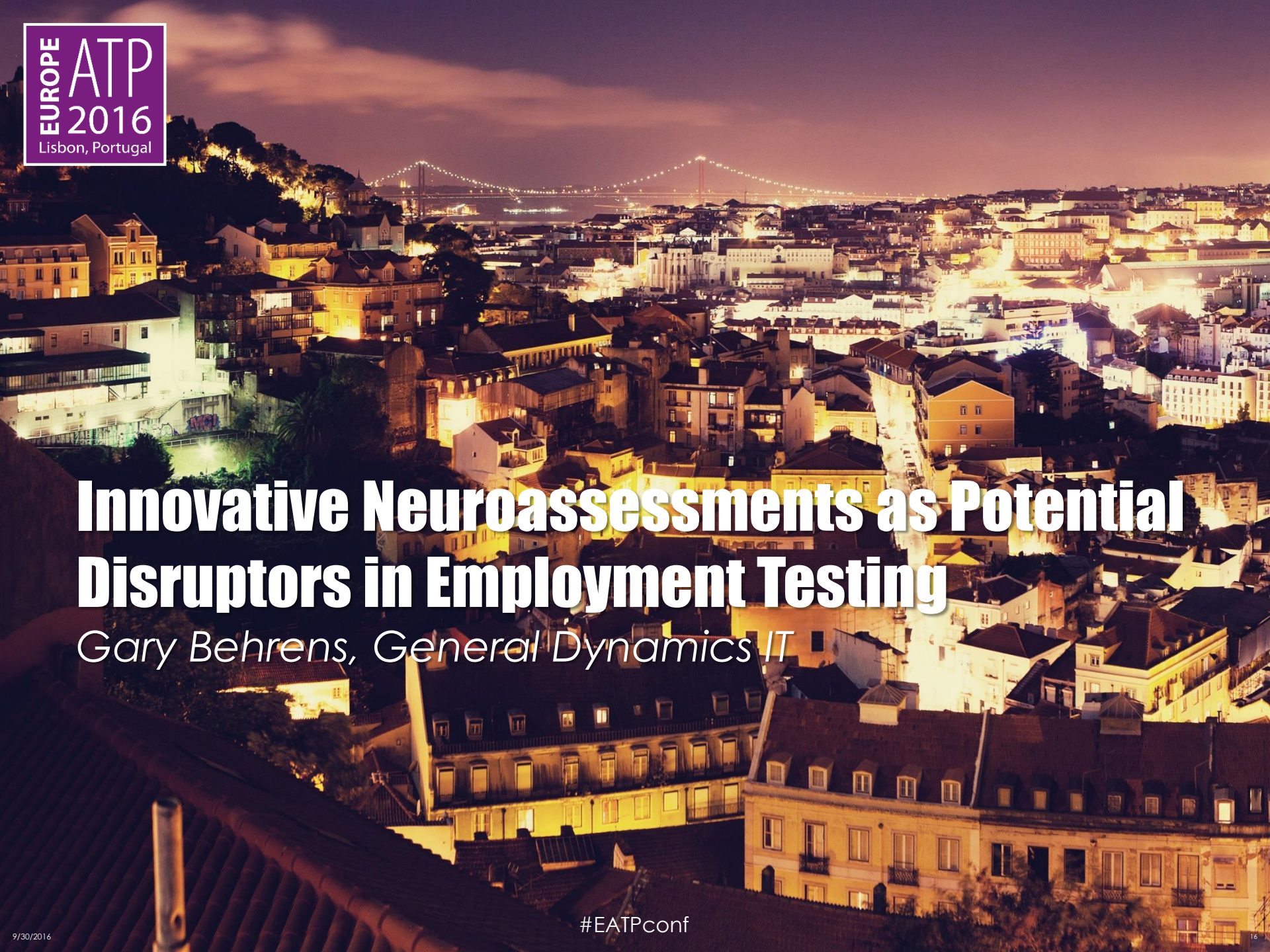
"What if we could read students' brains and see what they're thinking?"

Sleep and Brain Function



Calculation versus Estimation





Innovative Neuroassessments as Potential Disruptors in Employment Testing

Gary Behrens, General Dynamics IT

EUROPE ATP 2016 Lisbon, Portugal

Innovative Neuroassessments as Potential Disruptors in Employment Testing

Online gamified measures

- Cognitive abilities, aptitudes and behaviour constructs
- Simple tasks and complex scenario-based simulations

Innovative technology applications

- Brain imaging research and neuroscience based
- Using big data for real-time predictive analytics

Disruptive business strategies

- Simplify/speed up typical recruitment process
- Displace Multiple Choice Response assessments
- Link to sophisticated job search platforms

Innovative Neuroassessments as Potential Disruptors in Employment Testing

- Savvy marketing strategies
  - Targeting Millennials
  - Partnering with colleges
  - Generating media buzz
- Compliance envelope pushed
  - Test standards evidence needed
  - Legal compliance uncertain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