EEG Sub-core (TO 4.6)

Thomas Ferree (UTSW), John Hart (UTD)

Background
- EEG measures brain electrical activity on time scales of neurons
- Various oscillations have distinct physiological mechanisms
- Abnormalities in oscillations are useful for clinical diagnosis

Objectives
- Detect group differences
- Derive sensitive markers for single subjects
- Gain insight into possible anatomical/physiological origins

Methods
- EEG data acquired from resting subjects (eyes opened/closed)
- Selection of artifact free data
- Elimination of topographical distortions
- Power spectrum analysis
- Group comparisons/classifiers

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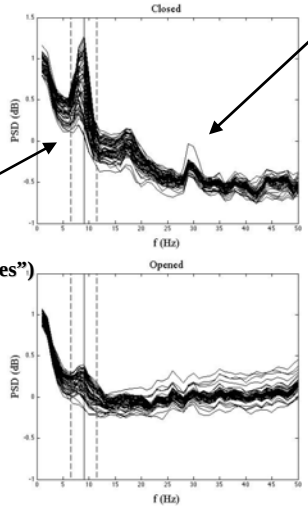
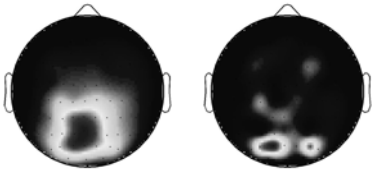
Normal Power Spectrum



Low frequency activity ("slow waves")

High frequency activity (fast waves)

Normal Alpha Reactivity



Scalp **Inner Skull**

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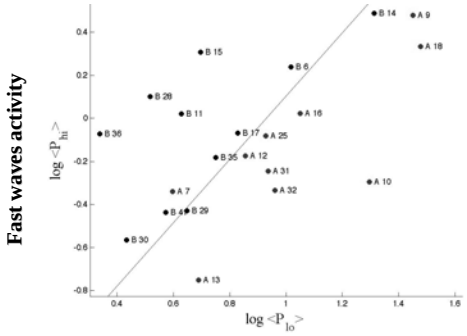
Global Slowing



Slow waves activity

	P_{lo} (dB)	P_{hi} (dB)
Group A	1.026	− 0.13
Group B	0.704	− 0.05
p	0.019	0.59

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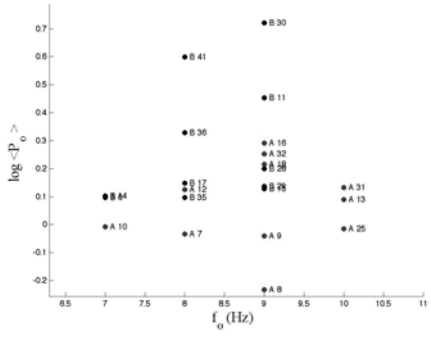
Reduced Alpha Reactivity



	f_{alpha}	ΔP_{alpha} (dB)
Group A	8.91	.070
Group B	8.27	.274
p	0.10	0.022

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Group A had…

- "EEG Slowing:" more low-freq activity and less high-freq activity
- Slowing was global, i.e., found in every brain region
- Reduced alpha reactivity to visual stimulus

Interpretations

- Slowing is generally associated with reduced input from the ascending activating system
- Spatially global pattern of slowing is consistent with subcortical involvement
- Reduced alpha reactivity is also consistent with reduced input from the ascending activating system