

MEG/EEG & Auditory Processing

Jonathan Z. Simon

University of Maryland, College Park

Time Matters

- The “Fourth Dimension”
- Obvious to practitioners of MEG/EEG
- Response time course reflects temporal stages of neural processing
- **Changes** in time course reflect changes in underlying (functional) neural circuitry

Neural Sources Matter

- Auditory System: MEG vs. EEG
- Sensor Space analysis still very valuable (requires standards)
- Neural source space analysis more valuable, but many caveats
- Intermediate representations? Neural “fingerprint”?

(Response) Size Matters

- N1 & N1m/M100: large & robust
- Large responses mean fewer repetitions, faster measurements
- Other peaks may also be robust
- Other measures may also be robust, e.g. **slopes** (“derivative peaks”)

Temporal Response Variability Matters

- Latency variability contributes to robustness under averaging
- Latency variability easy to measure even within subjects: use Bootstrap
- Latency difference statistical significance easy to measure within subjects: use Permutation Test

Systematic Response Variability Matters

- Latency dependence on stimulus is a powerful statistic