I knew you were going to say that: neural measures of predictive speech processing in people with autism

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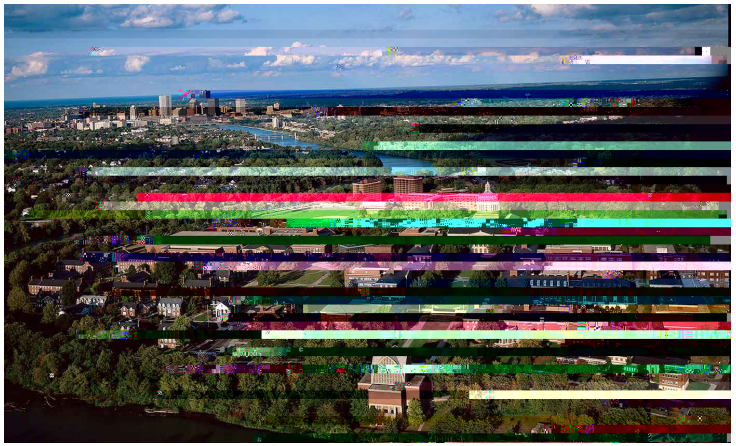
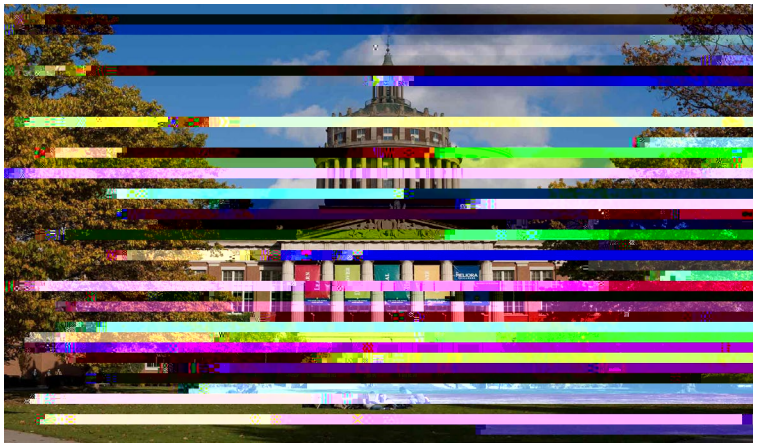
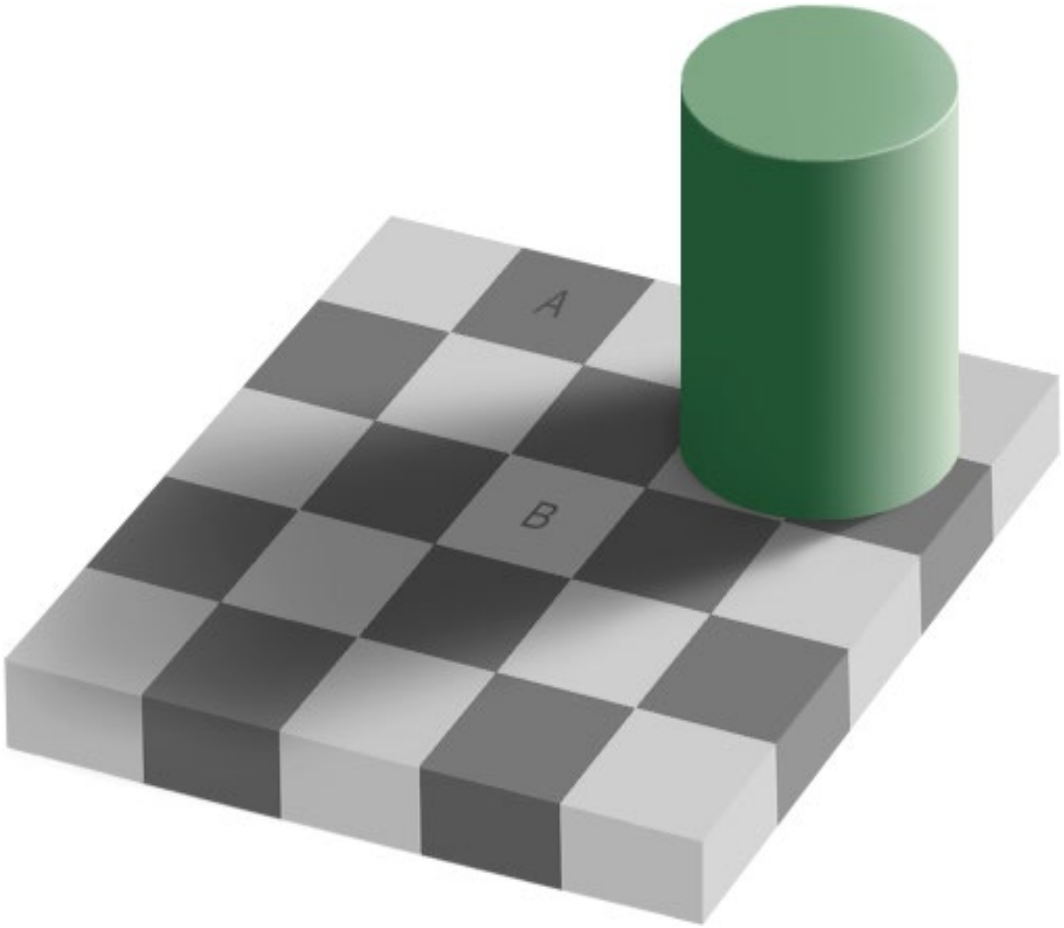




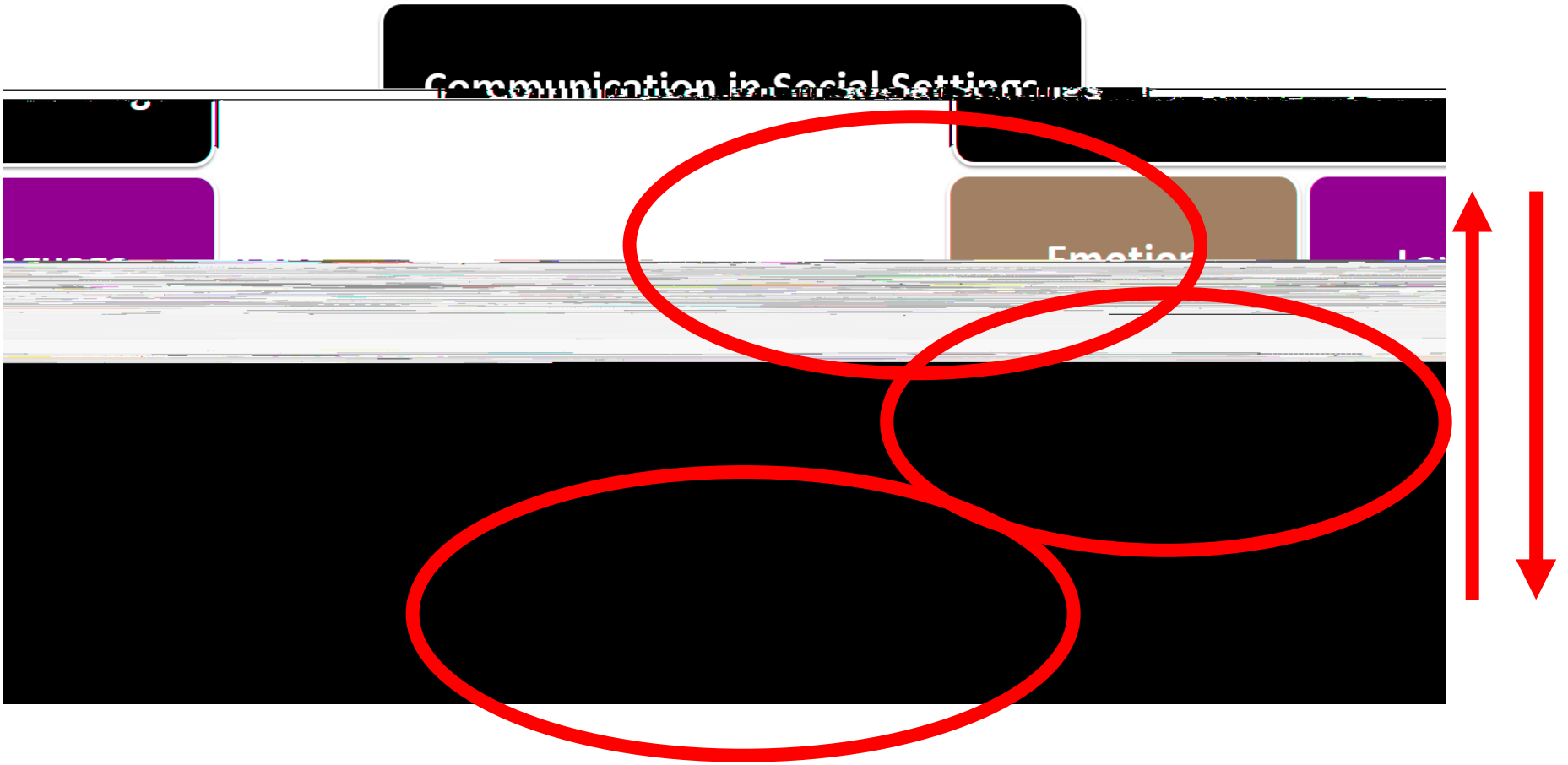
SkirbollFamily Autism Conference November 3, 202

Predictive Processing in Cortex

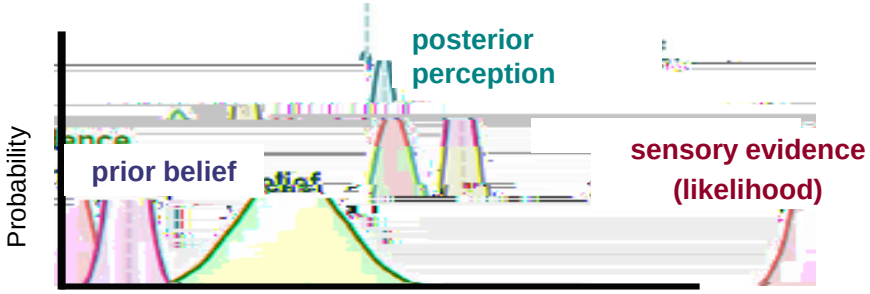


Adelson

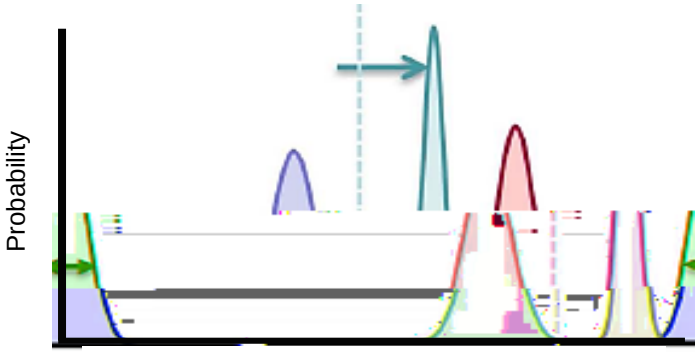
Predictive Processing in Cortex



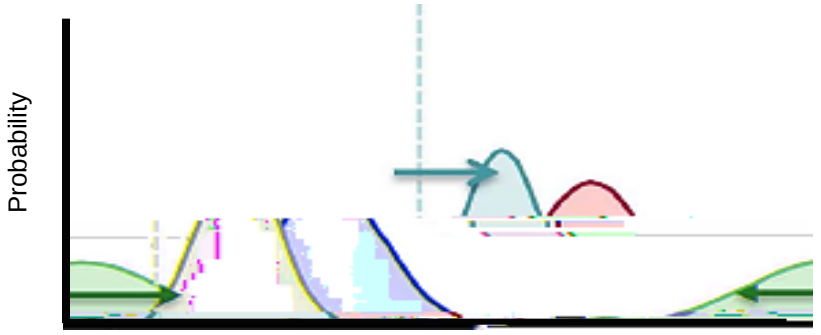
Predictive Processing in Cortex



We infer the causes of sensory input by combining that input with our learned/evolved model of the world



Increased sensory precision



decreased prior precision

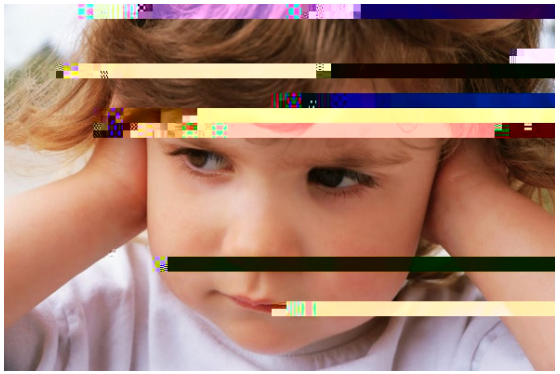
Horgaand Abi-Dargham2019, Adams 2018, Sterzer2018,Friston2010,Lupyanand Clark 2015

Predictive Processing in Cortex

Autism

- Enhanced pitch perception, hypersensitivity to loud sounds, and impaired auditory stream segregation *(O'Connor, 2012)*

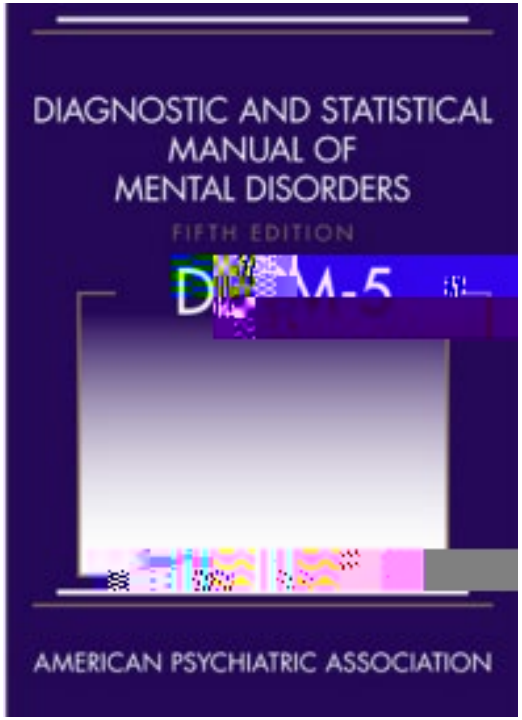
- Aberrant precision account *(Lawson et al., 2014)*



Schizophrenia

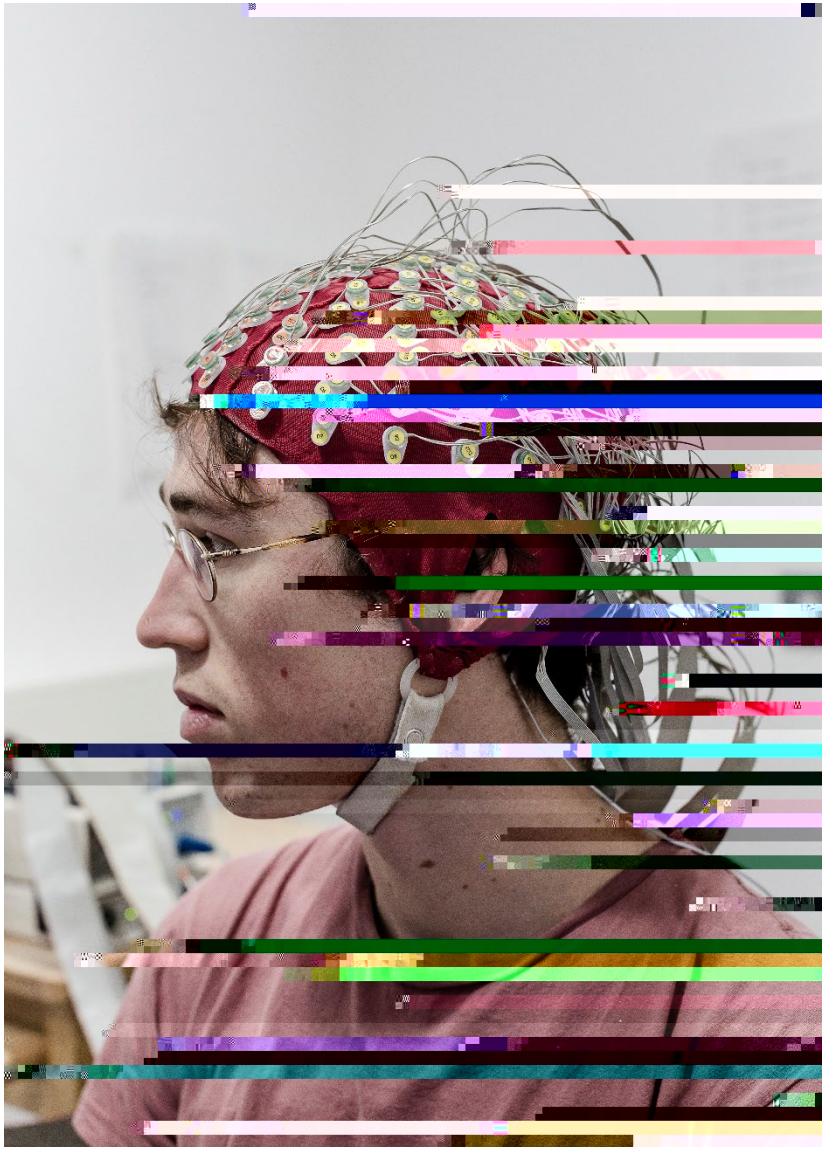
- Auditory hallucinations

- Weakened prediction errors and increased auditory cortex activity *(Horga et al., 2014).*



- Aim 1: Neurotypical Adults

Using EEG study speech processing

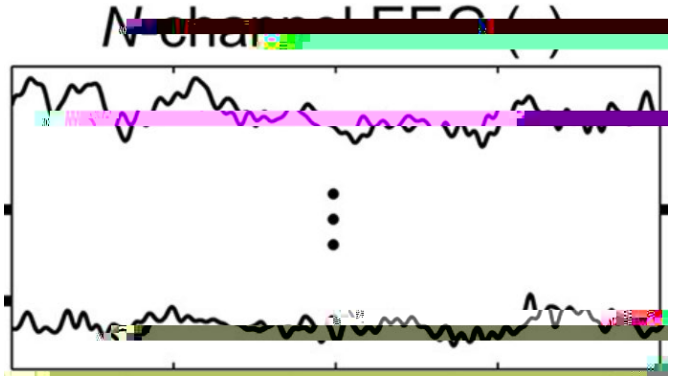


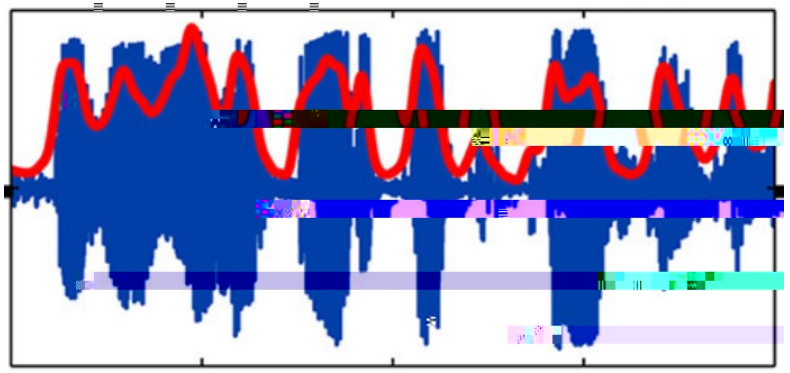
Neural activity tracks the dynamics of natural speech

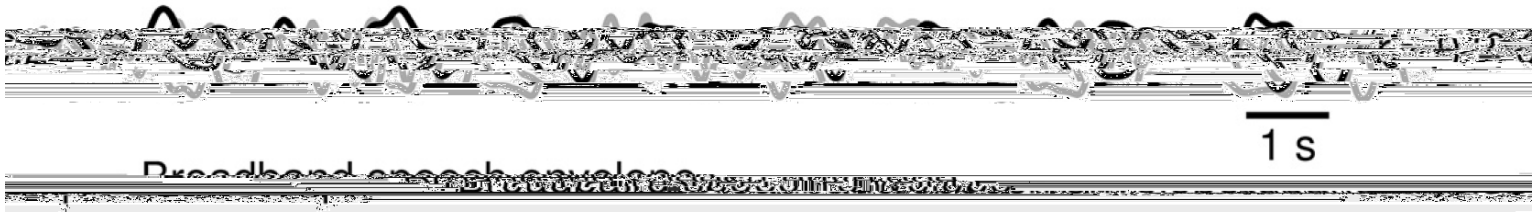
Recorded EEG “brainwaves”

fluctuate in a way that is correlatedwith

fluctuations in speech energy





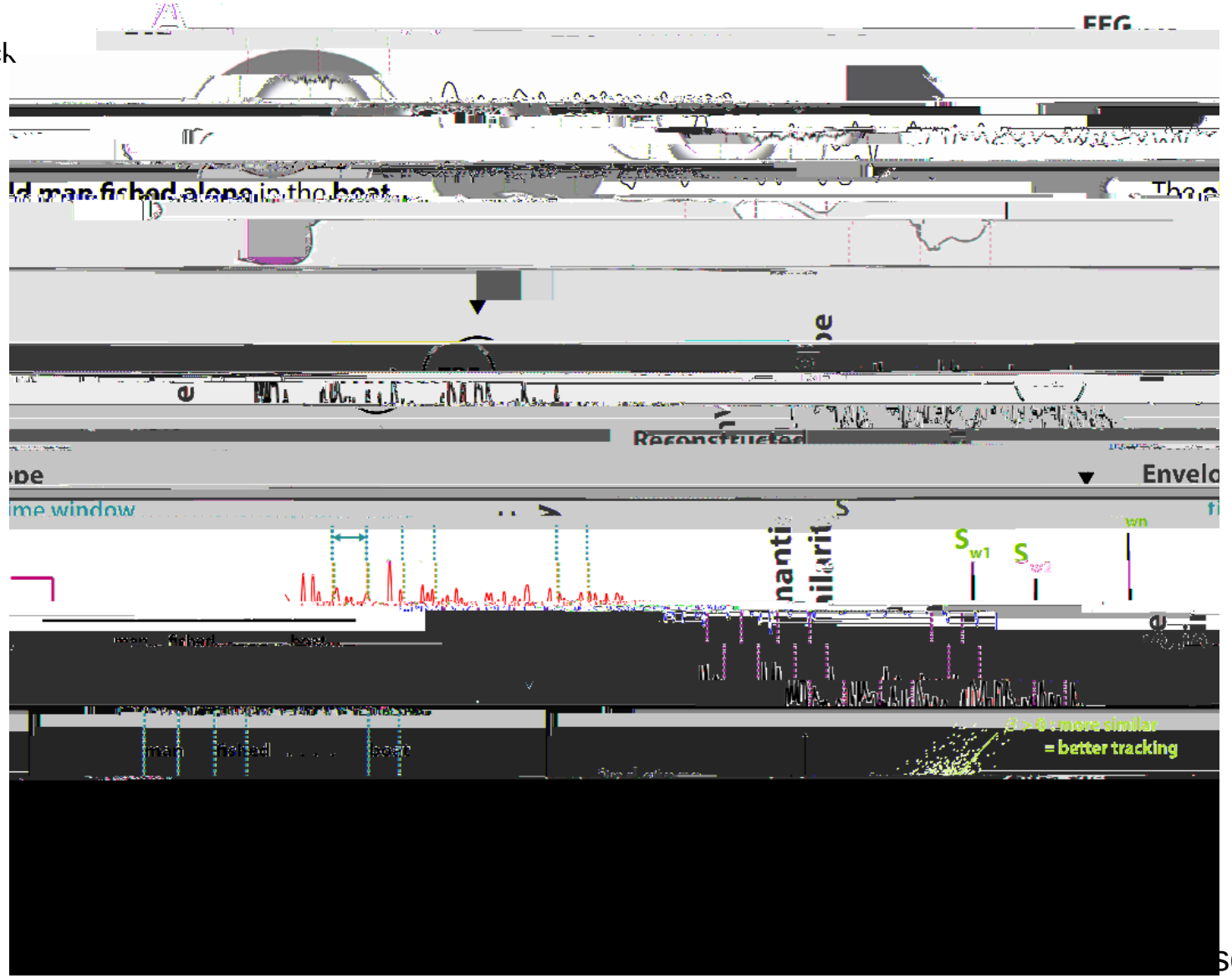


Predictive Processing of Natural Speech

- I take my coffee with cream and…
-

Michael Broderick

Semantic Context Enhances the Early Auditory Encoding of Natural Speech



sci 2019

Michael Broderick

Semantic Context Enhances the Early Auditory Encoding of Natural Speech

Broderick et al, J Neurosci, 2019