



# How long is long?

**An MEG study of M100 response in tracking word  
length in Bangla/Bengali**

Swarnendu Moitra, Dustin A. Chacón, Linnaea Stockall

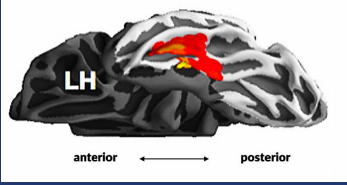
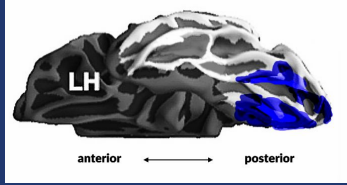
**POSTER # 8075**

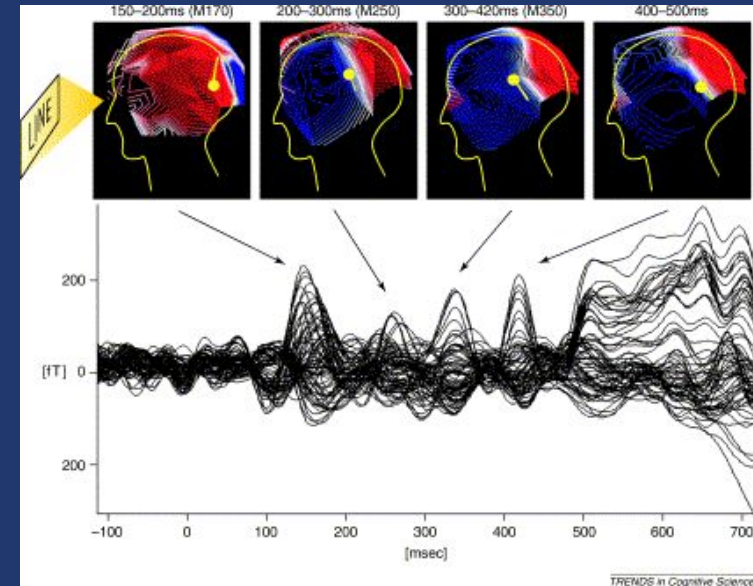
9th Annual Conference of Cognitive Science, IIT DELHI

# English vs. Bangla

WORD	Protest	প্রতিবাদ
Graphemes	P R O T E S T (7)	প্র তি বা দ (4)
Glyphs		প ্র ি ত ব া দ (7)
Phonemes	/prə'test/ (7)	/p r ô t i b a d / (8)

# Background

<p><b>M100</b></p>	<p>Luminosity, visual complexity; <b>non-linguistic</b> properties</p>	<p>occipital cortex; fusiform gyrus</p>  <p>anterior ← posterior</p>
<p><b>M170</b></p>	<p>Morphological properties (e.g., lemma freq., morphological affix freq., transition probability)</p>	<p>Occipital-temporal cortex and fusiform gyrus</p>  <p>anterior ← posterior</p>



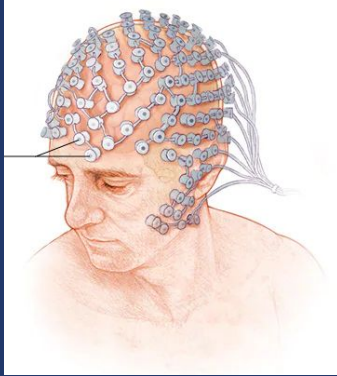
# Question

**Does M100 reflect early stages of linguistics analysis,  
or only psychophysical responses to visual stimuli?**

# Why Magnetoencephalography?

Temporal

Spatial



EEG

>

<



MEG

>

<



fMRI

# Methods

1. 152 Morphologically complex **grammatical words** eg. দুর্ঘটনা, প্রতিশোধ
2. 152 Morphologically complex **pseudowords** eg. দুসূর্য, প্রতিরুটি
3. 22 Native Bangla Participants - Lexical Decision Task
4. Continuous MEG recording

# Results

			M100
Graphemes	প্রতিবাদ	(4)	$p = 0.65$
Glyphs	প্ৰতিবাদ	(7)	$p = 0.32$
Phonemes	/prôtibad/	(8)	$p = 0.01$



Fig 3. Posterior Left Fusiform Gyrus cluster M100 (100-130ms) ( $p = 0.01$ )

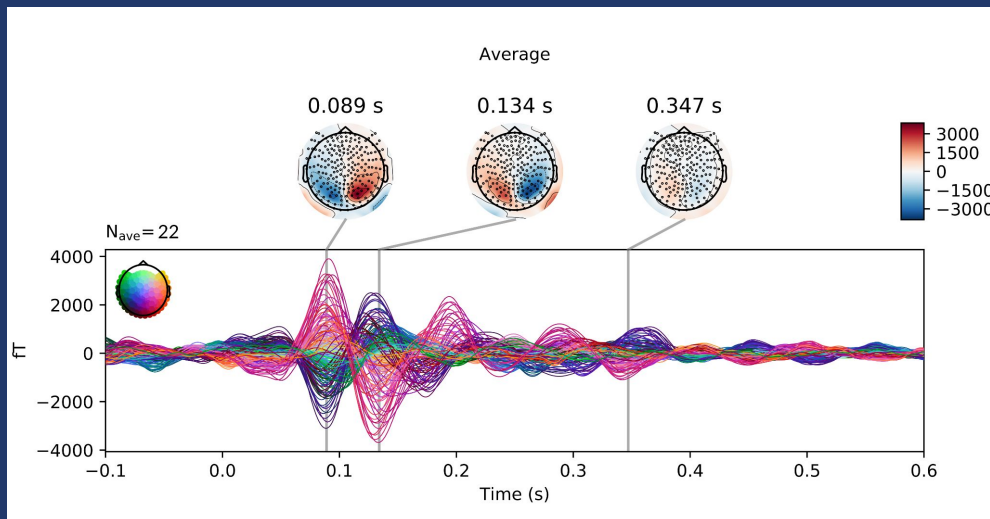


Fig 4. Anterior Left Fusiform Gyrus cluster M170 (170-200ms) ( $p = 0.04$ )

# Question

**Does M100 reflect early stages of linguistics analysis,  
or only psychophysical responses to visual stimuli?**

- **Tracks Phonemes** 





Economic  
and Social  
Research Council

The support of the Economic and Social  
Research Council (ESRC) and NYUAD  
grant(G1001) are gratefully acknowledged.



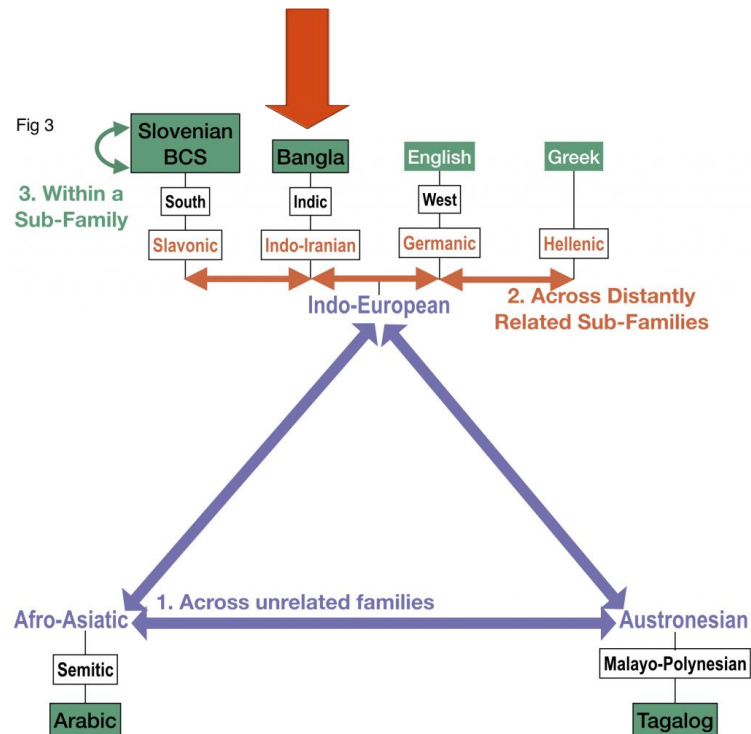
## Systematicity and Variation In Word Structure Processing Across Languages: A Neuro-Typology Approach



Dr. Linnaea Stockall



Dr. Dustin A. Chacón





Queen Mary  
University of London

**POSTER # 8075**