

NEUROSYNTH ASSIGNMENT INSTRUCTIONS (STUDENT HANDOUT)

Overall Learning Objectives

- (1) Develop understanding of functional neuroanatomy
- (2) Apply knowledge of scientific method
- (3) Compare study designs
- (4) Practice research communication

PART 1 - A) Pain Assignment

Instructions:

1. Go to [Neurosynth.org](https://neurosynth.org)
2. Enter the functional term "Pain"
3. Note XYZ coordinates for 5-10 brain areas activated in the resulting meta-analysis
4. Go to [BioImage Suite](https://biolmage-suite.org/) to find the corresponding Brodmann's Area, Tailarach and MNI space coordinates for each region.
5. Choose 2-3 publications from the list of underlying "Studies" to read and report upon.

Submission Requirement:

A short lab report and slide presentation (to be shared *via* class discussion) containing the following:

- A brief description of the steps taken to generate the brain activation map for "Pain", via Neurosynth.
- A screenshot of the activation map for "Pain".
- A list or table of 5-10 activated brain regions including 1) XYZ coordinates and the corresponding 2) Brodmann's Area, 3) Tailarach and 4) MNI space locations for each region of interest.
- A brief summary of the chosen few "Pain Studies", for background.
- A brief discussion about how the activated regions of interest are connected in the processing of "Pain" information.
- References Cited in APA format

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PART 1 - B) Neuroanatomy Assignment

Instructions:

1. Go to [Neurosynth.org](https://neurosynth.org)
2. Enter the anatomical terms (e.g., labels, XYZ coordinates or Brodmann's area) for this activation pattern of interest:

Activation Pattern to Investigate				
Regions of Interest (ROIs)	MNI Coordinates			Brodmann Area
	X	Y	Z	
L anterior cingulate cortex	-5	39	20	32
R anterior cingulate cortex	6	33	16	32
L anterior insula/ lateral OFC	-40	31	-13	47
R anterior insula/ lateral OFC	38	30	-12	47
Medial thalamus	9	-3	-6	NA
L primary sensory	-40	-27	47	1
R primary sensory	41	-27	47	1
L primary motor	-36	-19	48	4
R primary motor	38	-18	45	4

3. For each region of interest entered, choose 2-3 references from the list of underlying "Studies" from which to collect title and abstract information.
4. Enter all of the extracted title and abstract information into an online word cloud generator (e.g., www.wordclouds.com).

Submission Requirement:

A short lab report and a brief slide presentation (to be shared *via* class discussion) containing the following:

- A brief description of the steps taken to a) access studies on the assigned brain regions of interest, via Neurosynth and b) generate the word cloud.
- A screenshot of the resulting Word Cloud.
- A list or table of activated brain regions that were investigated.
- A brief summary of the behavioral functions of the investigated brain regions, for background.
- A brief discussion about how the investigated regions of interest may coordinate various functions, based on the text analysis.
- A list of References Cited (in APA format) for the Studies from which title and abstract data were extracted.

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PART 1 - C) Social Rejection Assignment

Instructions:

1. Go to [Neurosynth.org](https://neurosynth.org)
2. Enter the functional term "Social Rejection"
3. Note XYZ coordinates for 5-10 of the brain areas activated in the resulting meta-analysis
4. Go to [Biolmage Suite](https://biolmage-suite.org/) to find the corresponding Brodmann's Area, Tailarach and MNI space coordinates for each region.
5. Choose 2-5 publications from the list of underlying "Studies" to read and report upon.

Submission Requirement:

A 1-page lab report and a brief slide presentation (to be shared *via* class discussion) containing the following:

- A brief description of the steps taken to generate the brain activation map for "Social Rejection", via Neurosynth.
- A screenshot of the activation map for "Social Rejection".
- A list or table of 5-10 activated brain regions including 1) XYZ coordinates and the corresponding 2) Brodmann's Area, 3) Tailarach and 4) MNI space locations for each region of interest.
- A brief summary of your chosen "Social Rejection Studies", for background.
- A brief discussion about how the activated regions of interest are connected in the processing of " Social Rejection" information.
- References Cited in APA format

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PART 2) Individual Research Assignments

Instructions:

1. Go to [Neurosynth.org](https://neurosynth.org)
2. Enter either an anatomical term (*Option A*: e.g., anterior cingulate) or a functional term (*Option B*: e.g., emotion) of interest.
 - *Option A - Anatomical term*: Generate and save a word cloud for 5-10 underlying studies from the resulting meta-analysis.
 - *Option B - Functional term*: Note XYZ coordinates and corresponding Brodmann's Area or anatomical label for 5-10 of the brain areas activated in the resulting meta-analysis. Save a screenshot of the activation map.
3. Choose 4-5 studies from the list of underlying "Studies" to read and report upon.

Submission Requirement:

A 2-page lab report and a brief slide presentation (to be shared *via* class discussion) containing the following:

- A brief description of the steps taken to generate the brain activation map for the chosen anatomical or a functional term, via Neurosynth.
- Illustrations:
 - A descriptive illustration (e.g., word cloud, or activation map)
 - An infographic or general illustration describing the links between the anatomy and behavioral function of interest.
- A brief summary of your chosen underlying studies, for background.
- A brief discussion about how one would design the ideal neuroimaging experiment to address one's question, considering the problem of forward versus reverse inference.
- References Cited in APA format