

# Transdiagnostic neural correlates of affective face processing in anxiety and depression

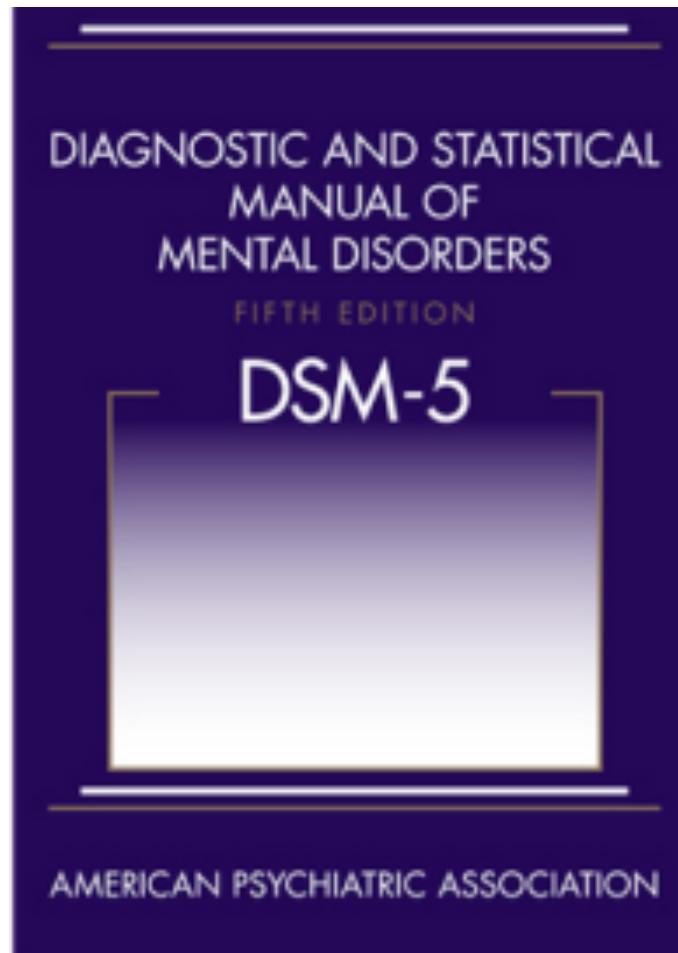
Annmarie MacNamara Ph.D., Heide Klumpp Ph.D., Amy E. Kennedy L.C.S.W., Scott A. Langenecker Ph.D., K. Luna Phan M.D.

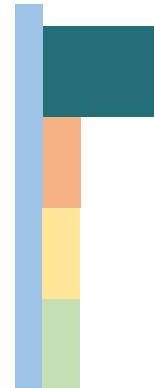
Soyeon Kim



Computational Clinical Science Laboratory

# “Disorder-specific approach”



- 
1. There is substantial discrepancy between the disorder-specific approach with our current understanding of depressive and anxiety disorders. (Shannon et al., 2017)
  2. Disorder-specific interventions pay relatively limited attention to comorbidity, despite evidence of high comorbidity rates up to 40– 80% in both clinical and epidemiological studies (Shannon et al., 2017)
  3. Despite the clinical utility of diagnostic categories, there are also some limitations to the reliability and validity of the diagnostic classifications that disorder-specific treatments have been based on (Shannon et al., 2017)

# “Transdiagnostic”?

→ Grouping disorders based on shared characteristics



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**Behavior  
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## Current Definitions of “Transdiagnostic” in Treatment Development: A Search for Consensus

Shannon Sauer-Zavala

Cassidy A. Gutner

Todd J. Farchione

Hannah T. Boettcher

Jacqueline R. Bullis

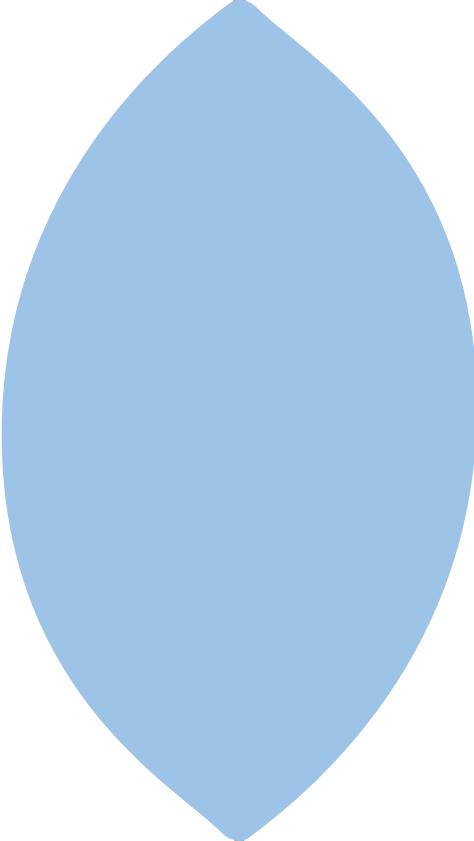
David H. Barlow

Center for Anxiety and Related Disorders, Boston University

The image shows the cover of the journal "Clinical Psychology Review". The title "Clinical Psychology Review" is at the top, followed by the volume information "40 (2015) 91–110". Below the title is the subtitle "Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood". The authors listed are Jill M. Newby<sup>a,\*</sup>, Anna McKinnon<sup>b,1</sup>, Willem Kuyken<sup>d</sup>, Simon Gilbody<sup>e</sup>, Tim Dalgleish<sup>b,c</sup>. The journal's logo is on the right. At the bottom, there is a "CrossMark" logo and a copyright notice: "© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)."

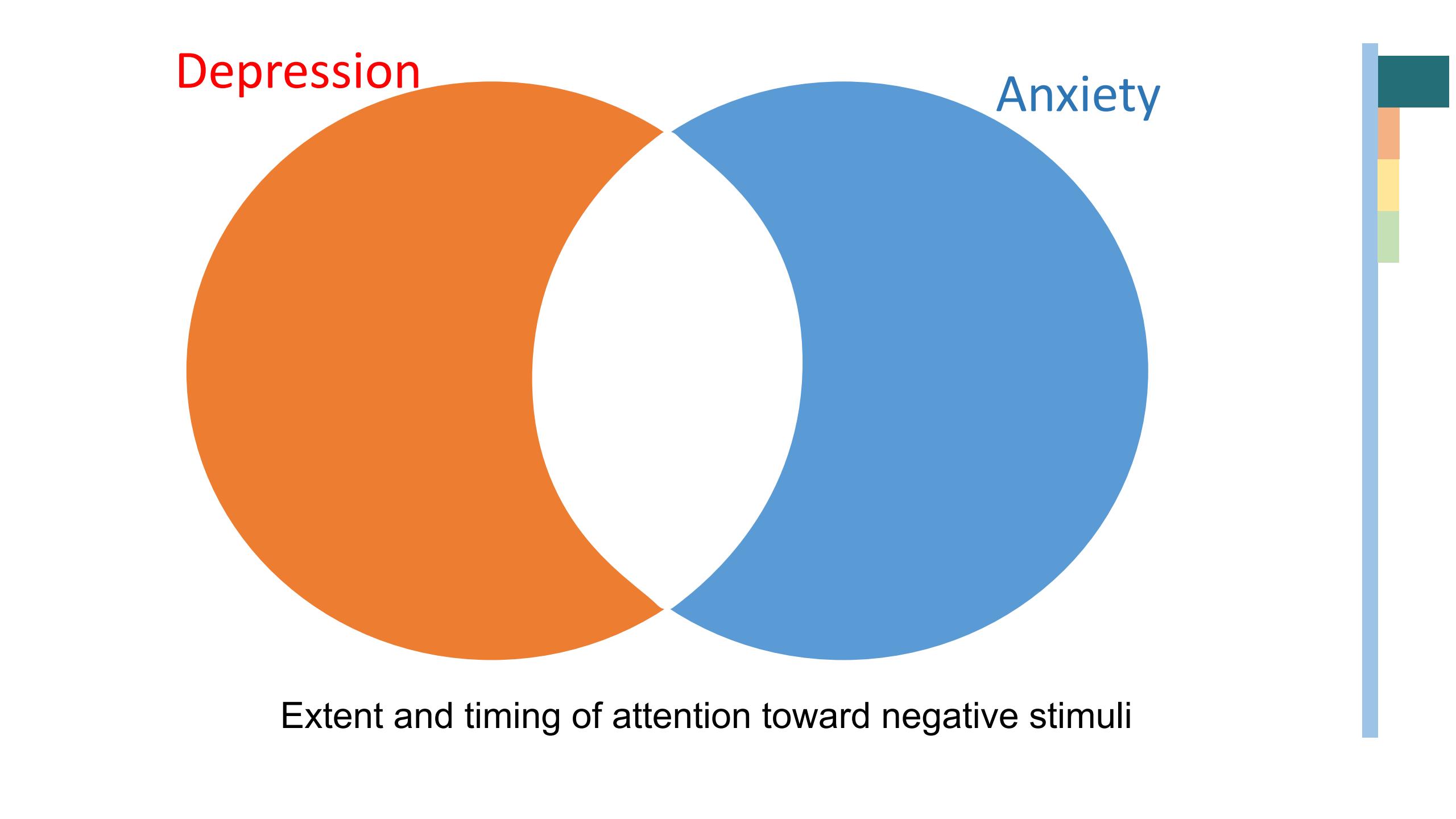
**Depression**

**Anxiety**



Heightened attention toward and processing of negative emotional information

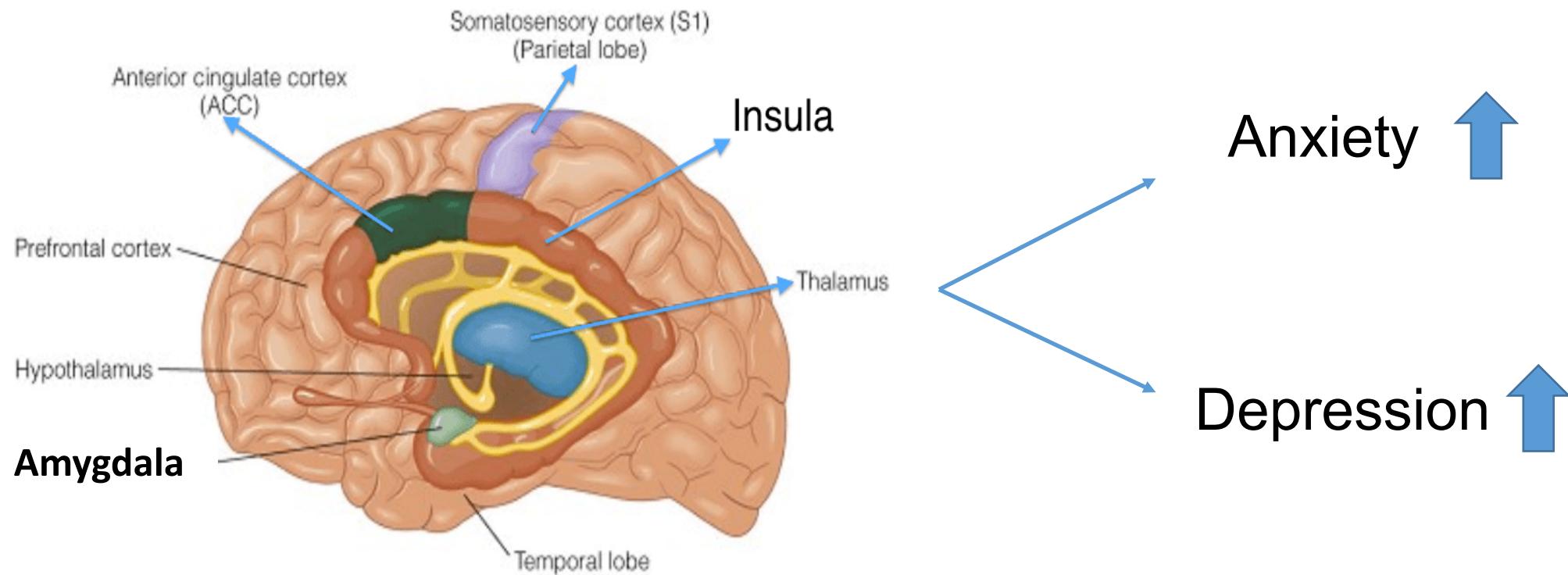


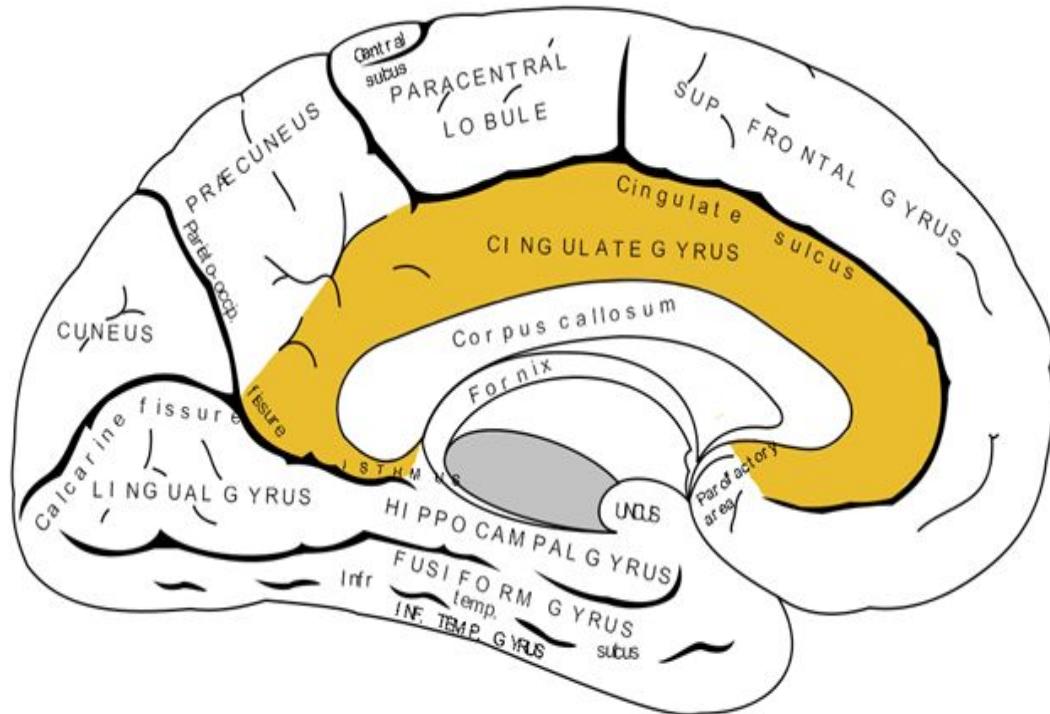


Depression

Anxiety

Extent and timing of attention toward negative stimuli



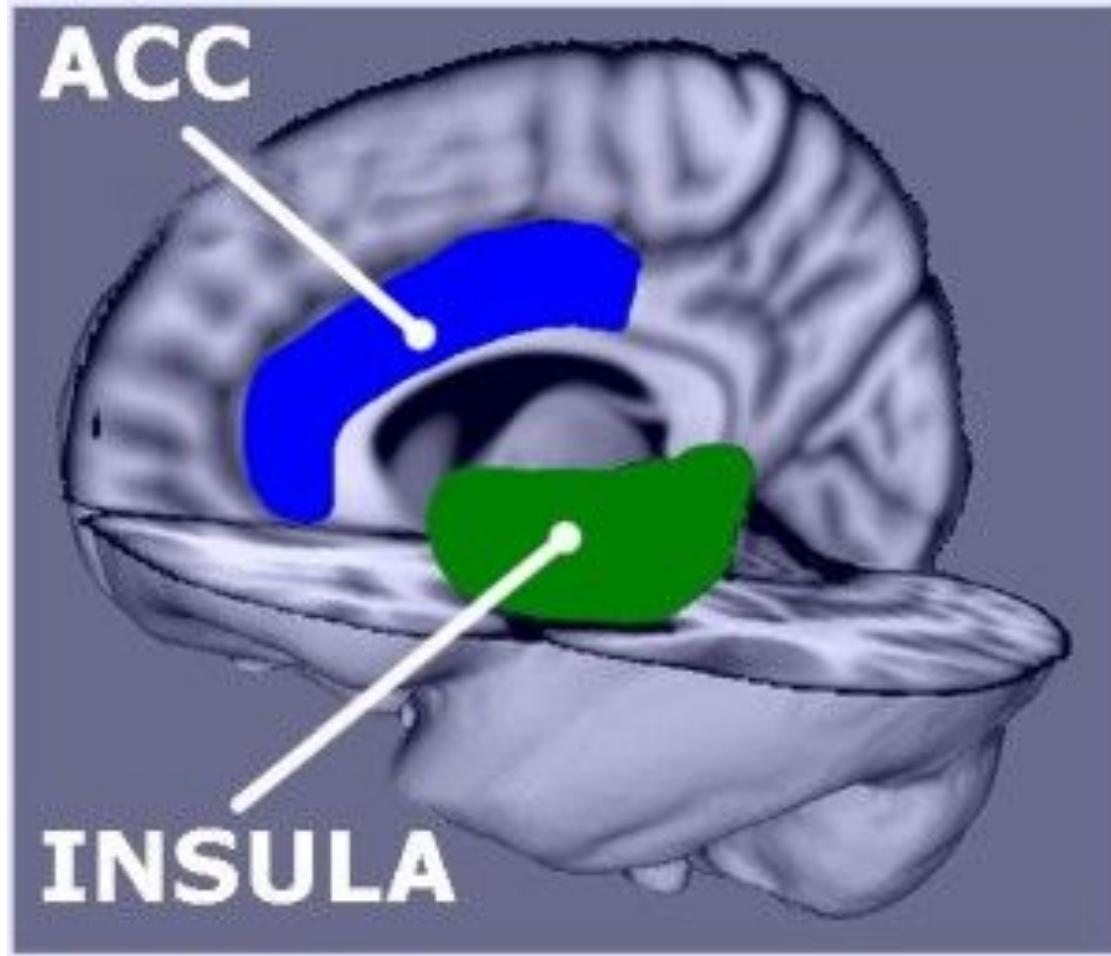


Anxiety



Depression



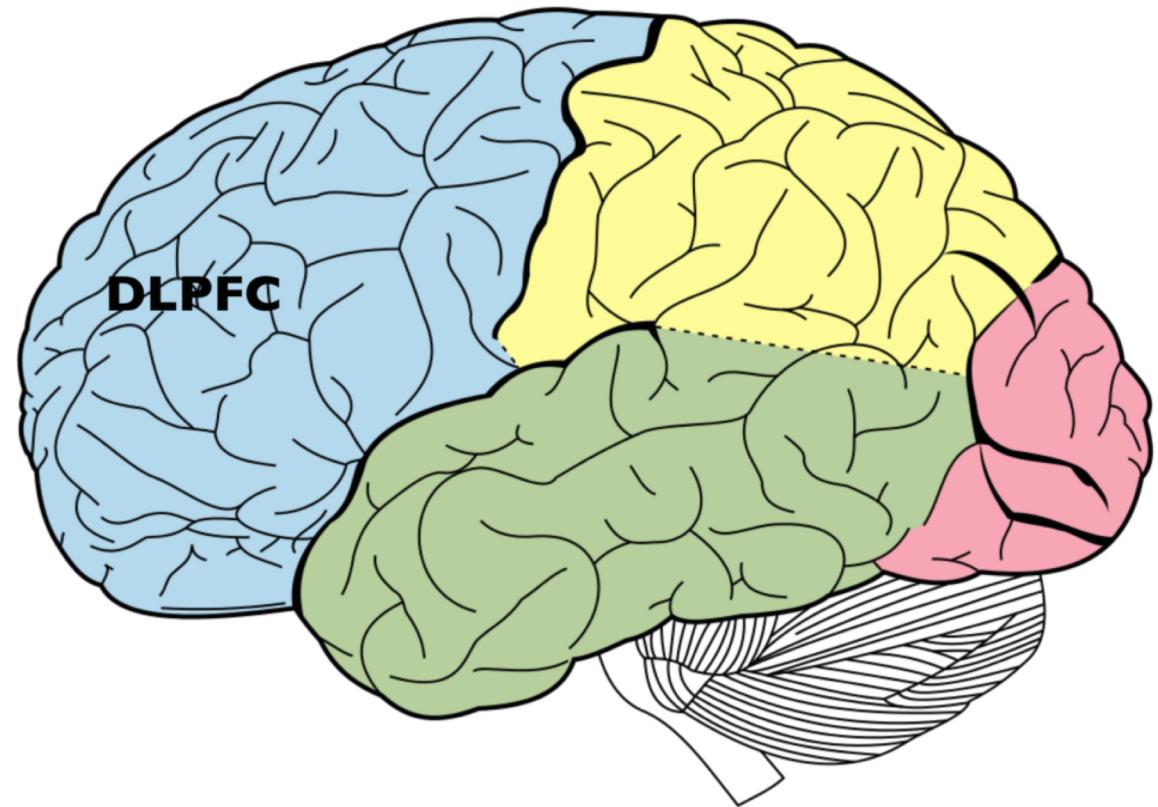


Anxiety

Depression

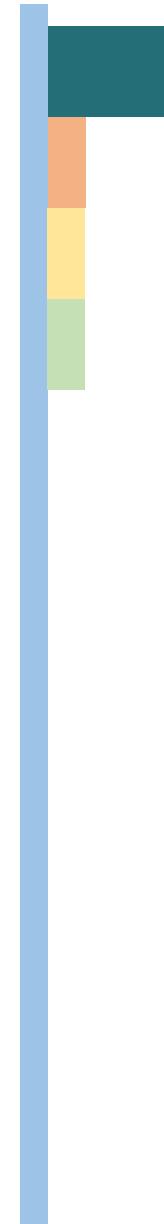
Psychosis





Anxiety ↓ ↑

Depression ↓

A text block containing two statements. The top statement, "Anxiety ↓ ↑", is preceded by a blue arrow pointing upwards and a red arrow pointing downwards. The bottom statement, "Depression ↓", is preceded by a red arrow pointing downwards.

# Purpose

Measure the effects of current symptoms on neural activation

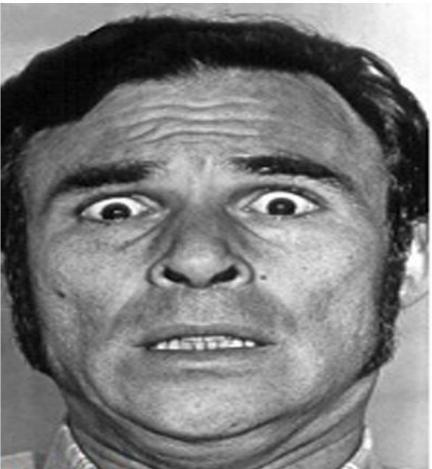
# Hypotheses

1. Compared with controls, patients would show increased activation in the Amygdala and insula for negative faces
2. Symptoms of anxiety would be associated with greater activation in the ACC and increased dlPFC activation for negative faces. Also, reduced dlPFC activation for symptoms of depression

# Methods

	Healthy controls ( <i>n</i> = 57)		Patients ( <i>n</i> = 142)		Group comparison
	<i>n</i>	%	<i>n</i>	%	
Gender					
Female	40	70.2	104	73.2	$\chi^2(1) = 0.66$
Male	17	29.8	38	26.8	
Race					
Caucasian	29	50.9	96	67.6	$\chi^2(1) = 0.15$
Other	22	38.6	45	31.7	
Primary diagnosis					
SAD			79	55.6	
MDD			43	30.3	
GAD			20	14.1	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age	27.5	9.8	25.9	6.9	$t(79.62) = 1.17$
Education	14.9	2.8	15.4	2.3	$t(197) = 1.35$
Hamilton depression	0.7	1.4	9.8	6.6	$t(161.82) = 18.73^a$
Hamilton anxiety	0.4	0.9	13.7	8.0	$t(152.60) = 16.70^a$

# Methods – Emotional Face Matching task



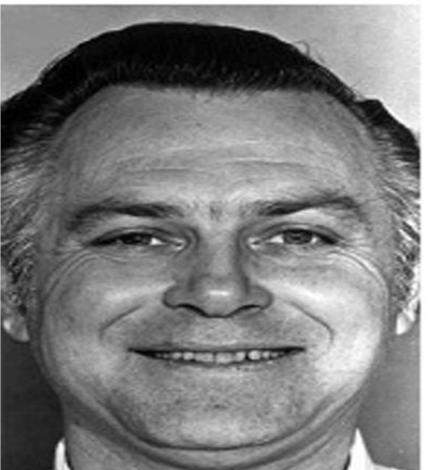
Fearful



Angry



Sad



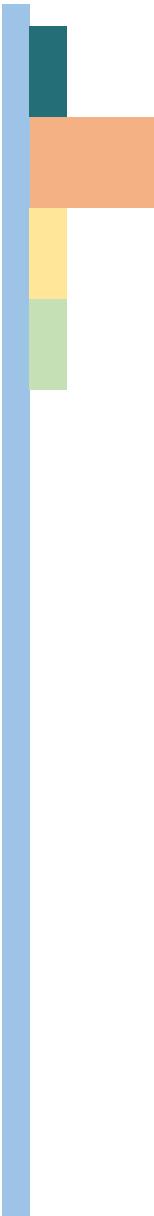
Happy



Disgusted

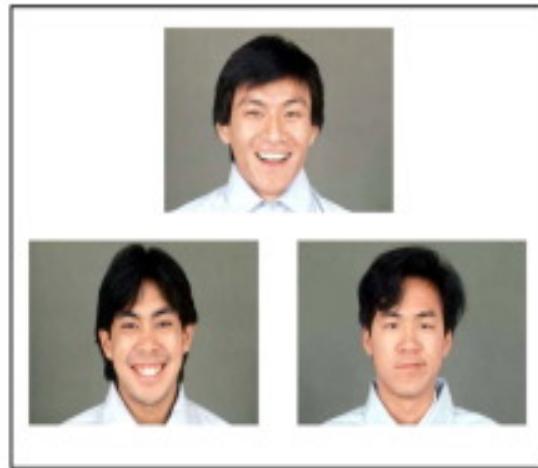


Surprised

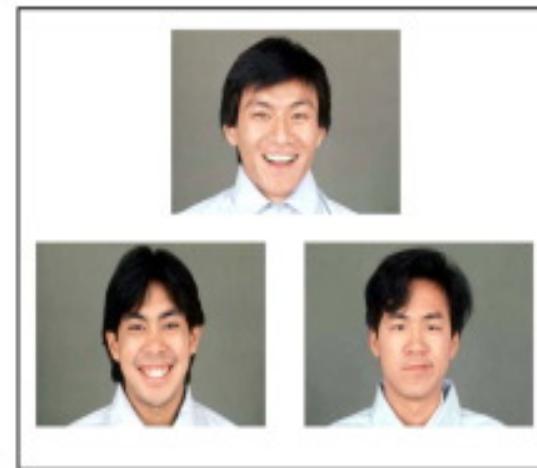




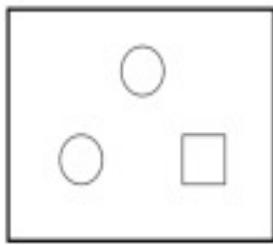
Emotional



Emotional

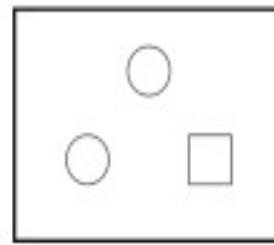


Geometric



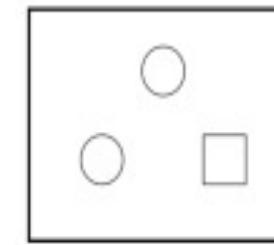
20s

Geometric



20s

Geometric



20s

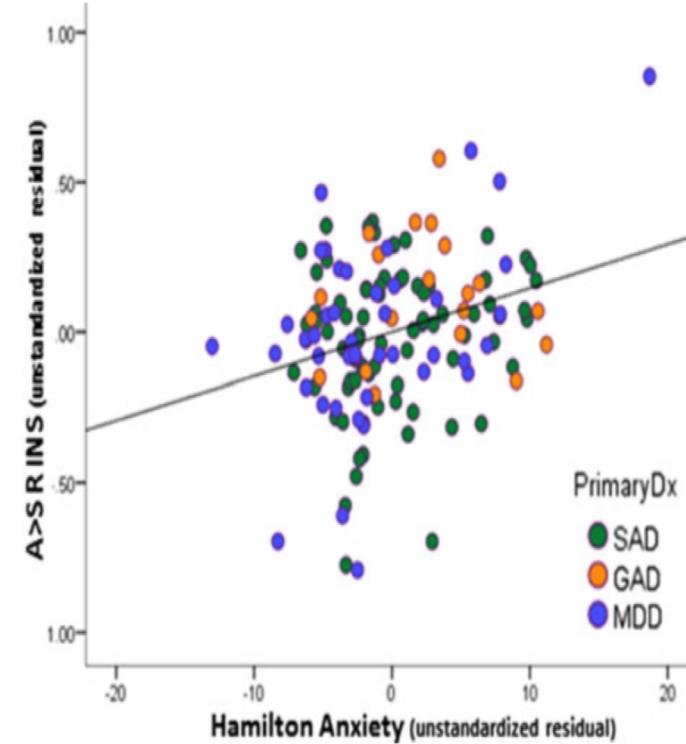
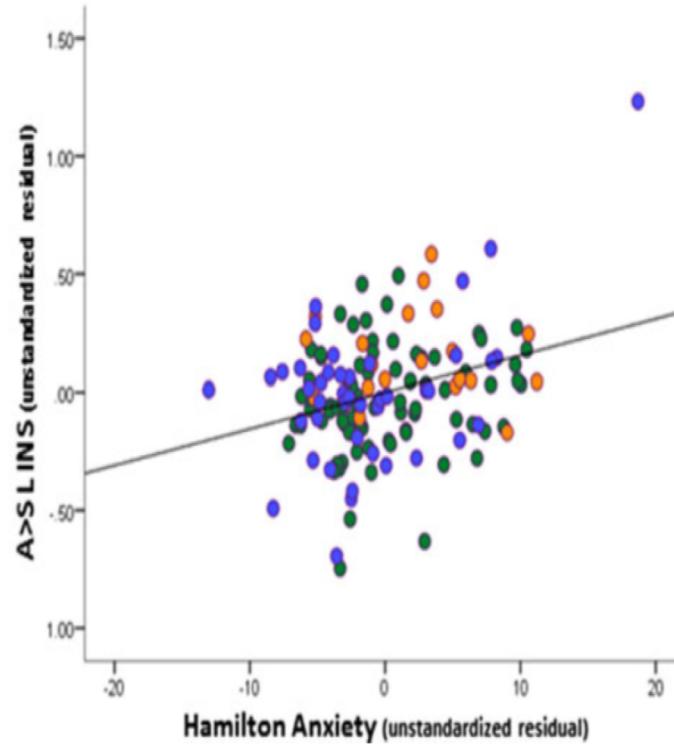
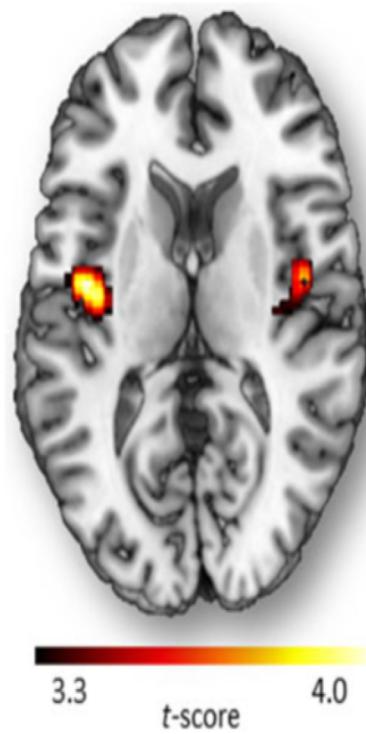


A

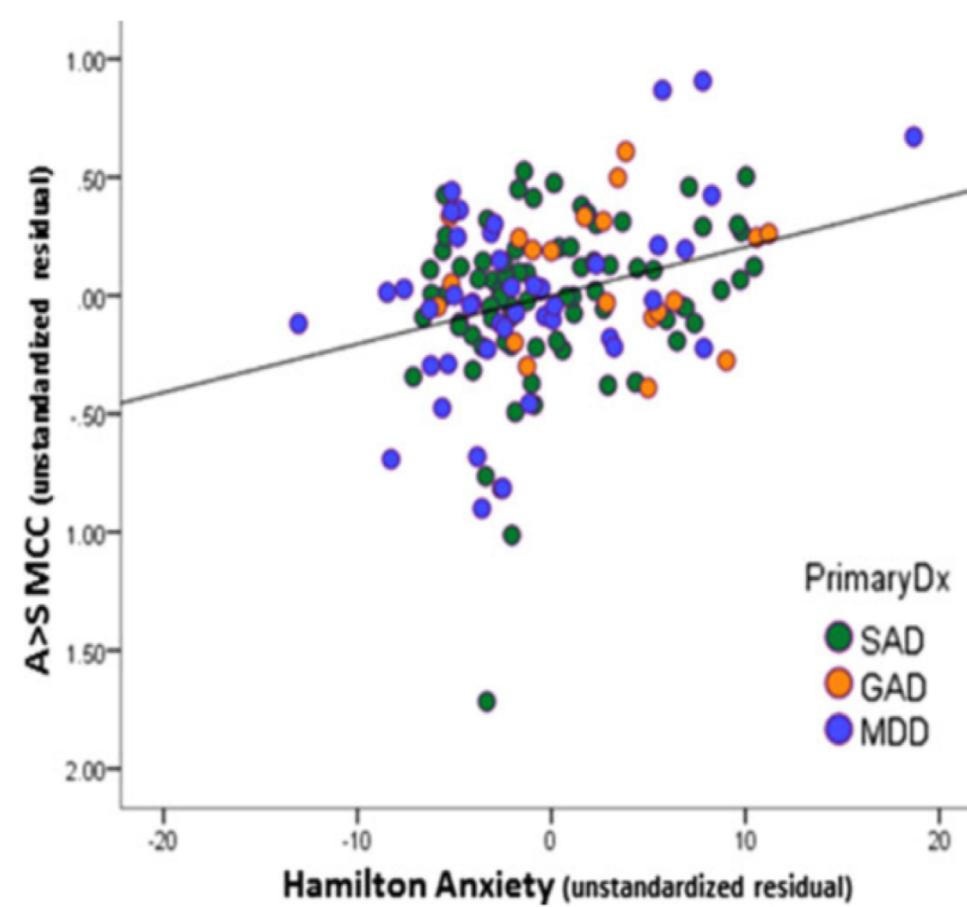
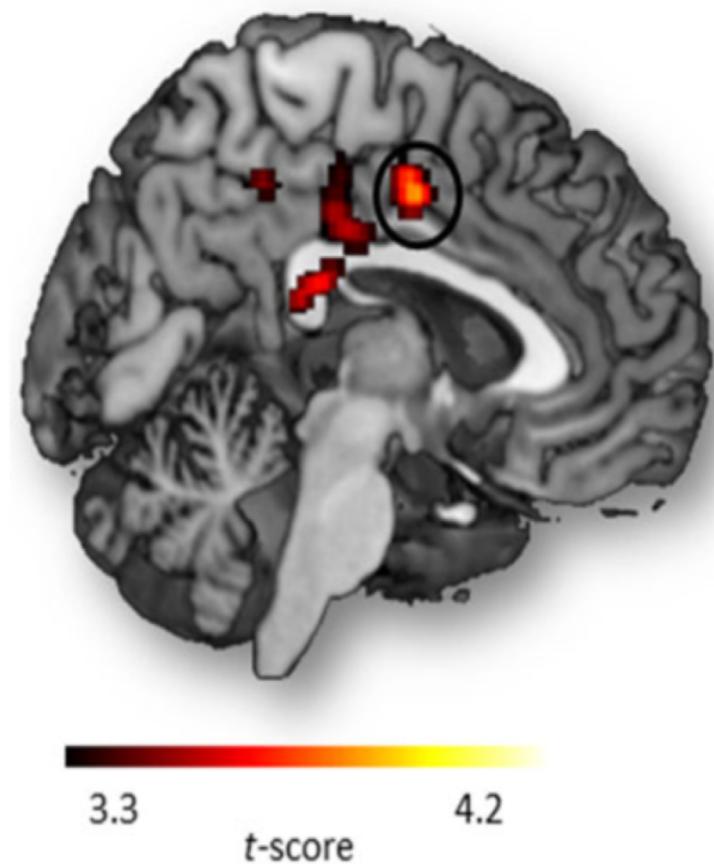


- Angry vs Shapes, Fearful vs Shapes, Happy vs Shapes
- Patient vs control
- HAM-A & BOLD, HAM-D & BOLD

# Results



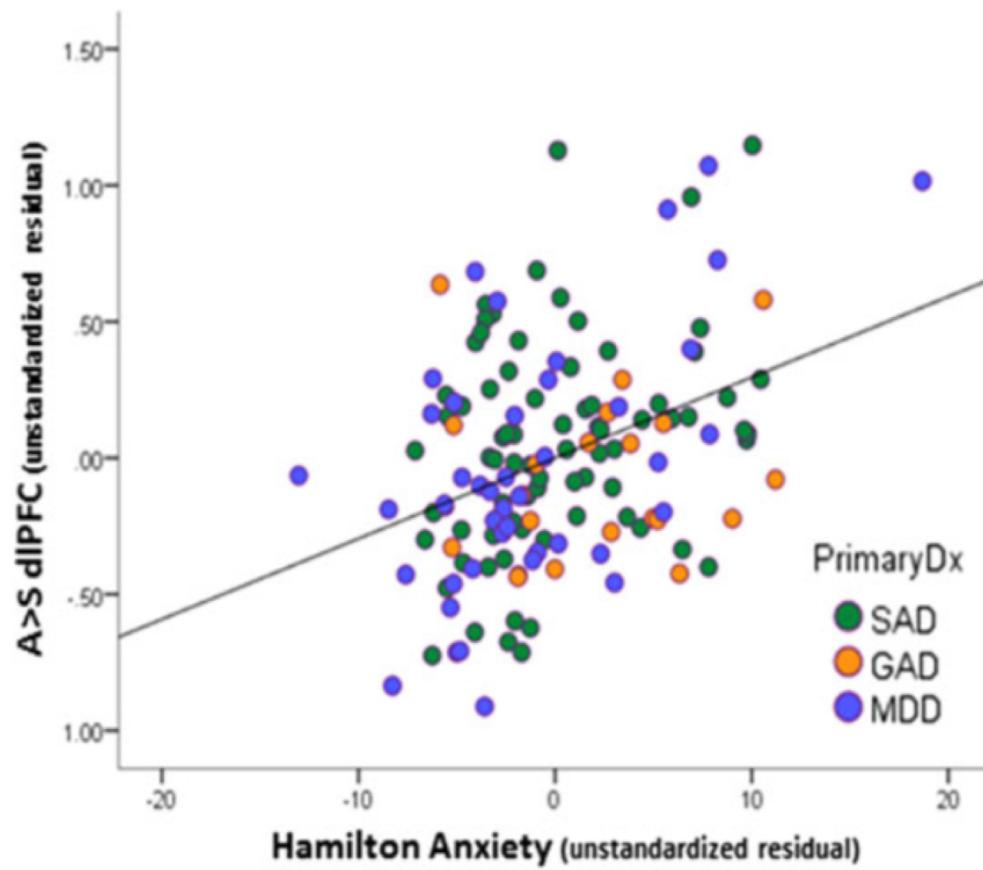
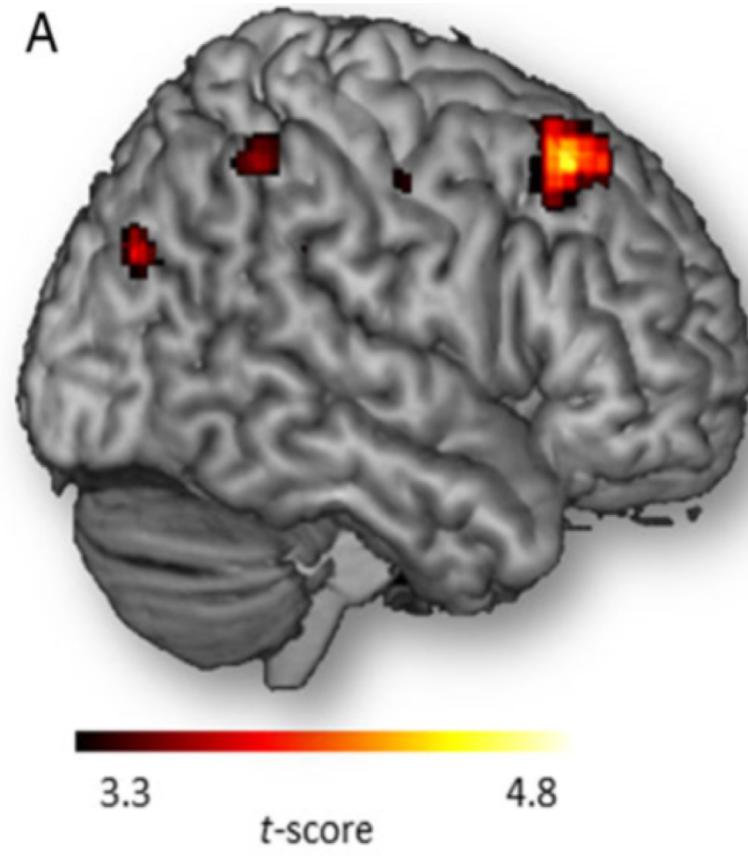
Anxiety → Left and Right insula



Anxiety →

Anterior & midcingulate cortex

A

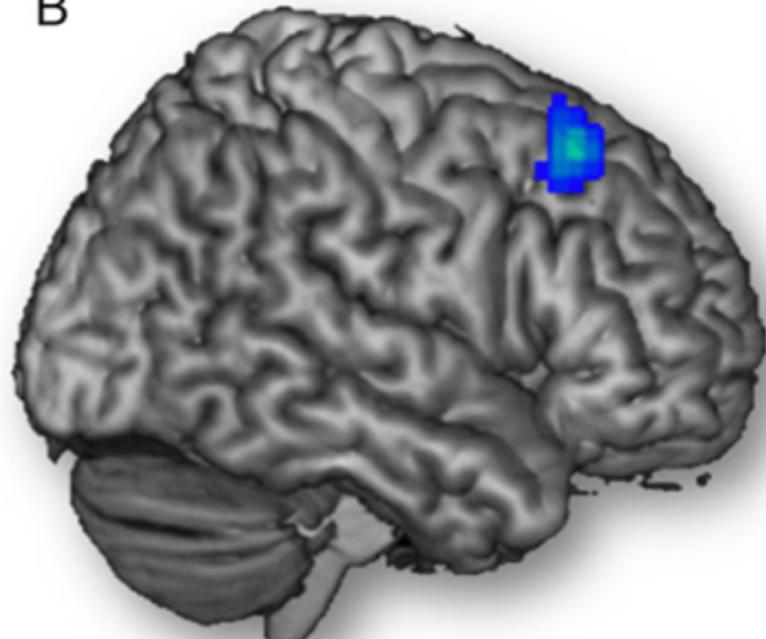


Anxiety

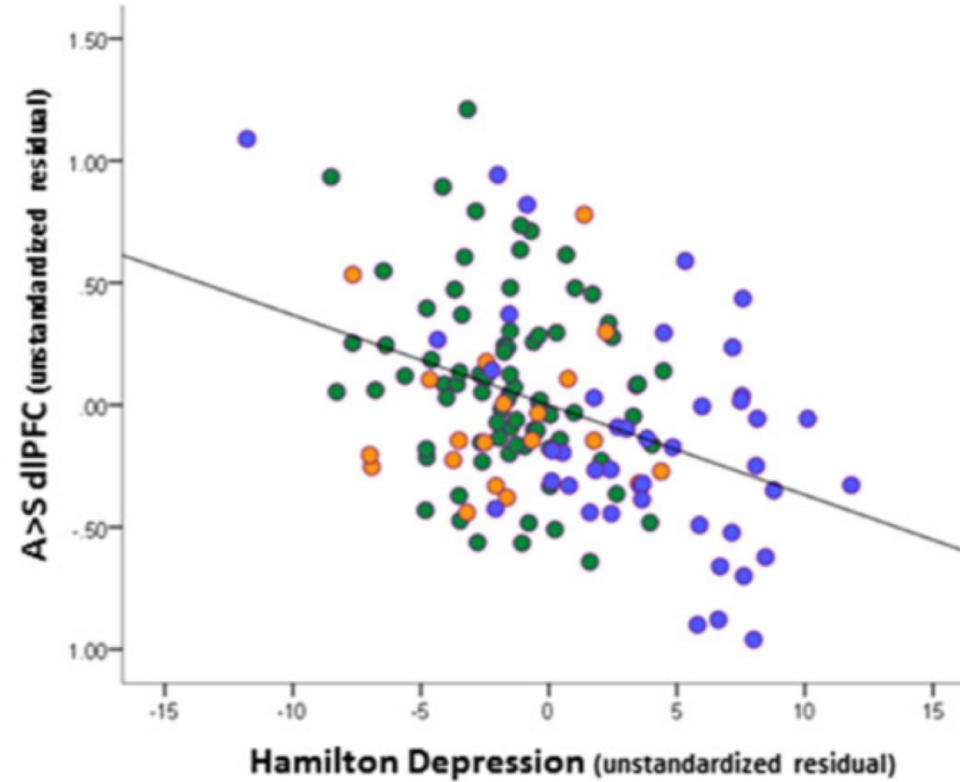


Right dlPFC

B



3.6                    5.4  
*t*-score



Depression



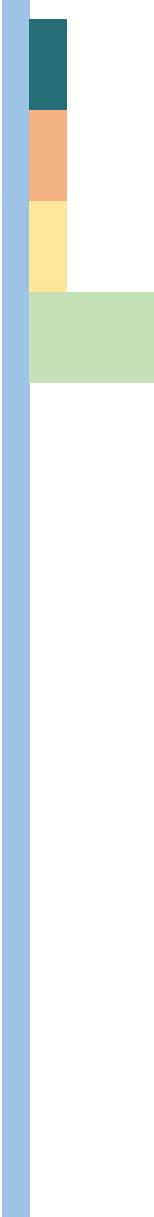
Right dIPFC

“Importance of paralimbic, midline cortical, and lateral prefrontal brain regions in the neurobiology of anxiety and depression.

...

Anxiety and depression can be dissociated at the neural level, and that these symptom profiles may at times exert opposing influences on neural activation (i.e., in the lateral PFC)”

# Limitations

- 
1. Only certain anxiety disorders were included
  2. Sad faces were not included among the stimuli
  3. Results reflect the salience of faces more generally, rather than emotion-specific effects
  4. HAM-A and HAM-D may be better at measuring symptom profiles for some disorders than others

# What I want to do is...



The image shows the top navigation bar of the UIC Psychiatry College of Medicine website. It features a blue header with the text "PSYCHIATRY COLLEGE OF MEDICINE" and "UIC" on the left. On the right, there are links for "Giving", "Events", "Our Websites", "Directory", "Directions", "Contact Us", "Search", and a red "+" button. Below the header, a secondary navigation bar includes "ABOUT US", "CLINICAL", "EDUCATION", "RESEARCH", "IJR", and "SUPPORT US".



## K. Luan Phan MD



### DESIGNATION

Professor of Psychiatry  
Associate Head for Clinical Services  
Associate Head for Clinical and Translational Research  
Director of the Mood and Anxiety Disorders Clinical and Research Programs

### CONTACT INFORMATION

📞 (312) 355-5954  
✉️ klphan@uic.edu  
🏢 Institute for Juvenile Research (IJR)  
1747 W. Roosevelt Rd.  
Chicago IL 60612  
📍 Room #244

- Use machine learning, find subtype of depression & anxiety based on the task performance
- Predict individual subtype

Thank you! ☺