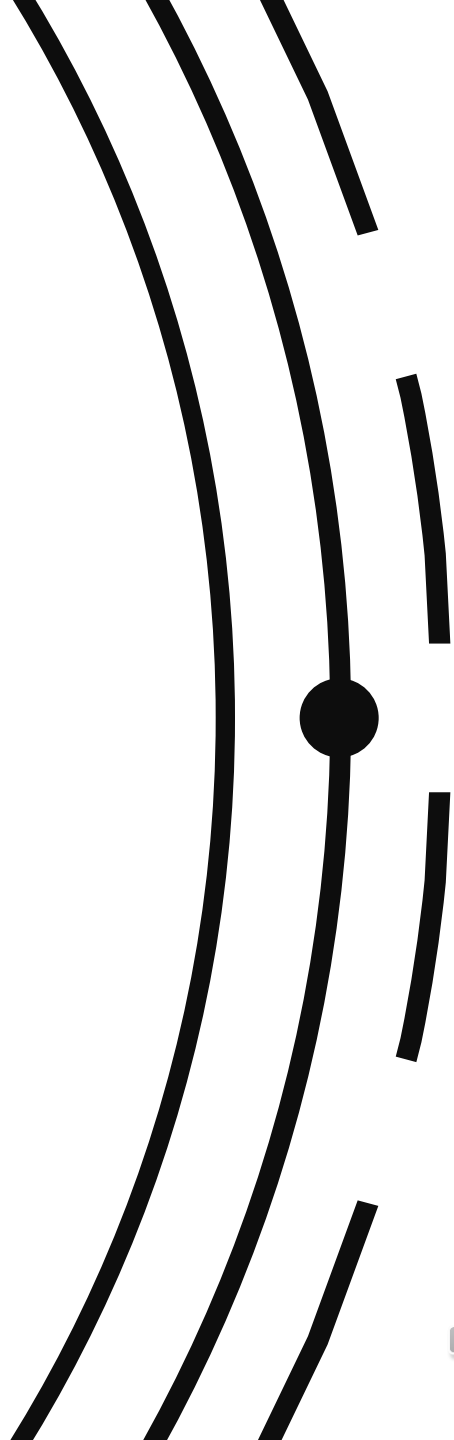
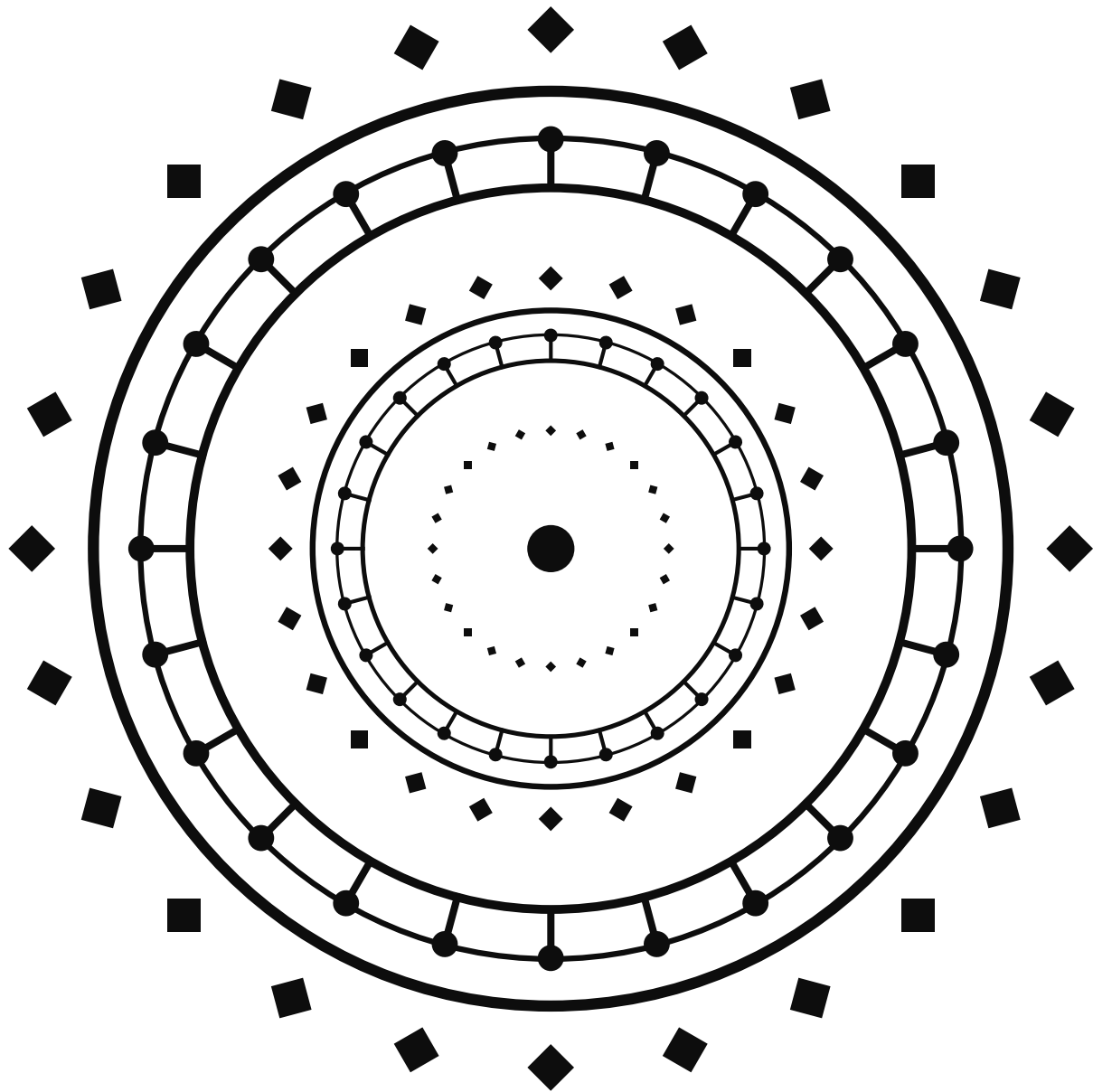


**Fear of Negative Evaluation is
associated with Connectivity Strength
within Dorsomedial Default Mode Network**

Seoul National University

JI SOO LEE D12

HARIN KIM, SEYUL KWAK, JEANYUNG CHEY



01

Introduction

Methods

02

03

Results



NOW

Introduction

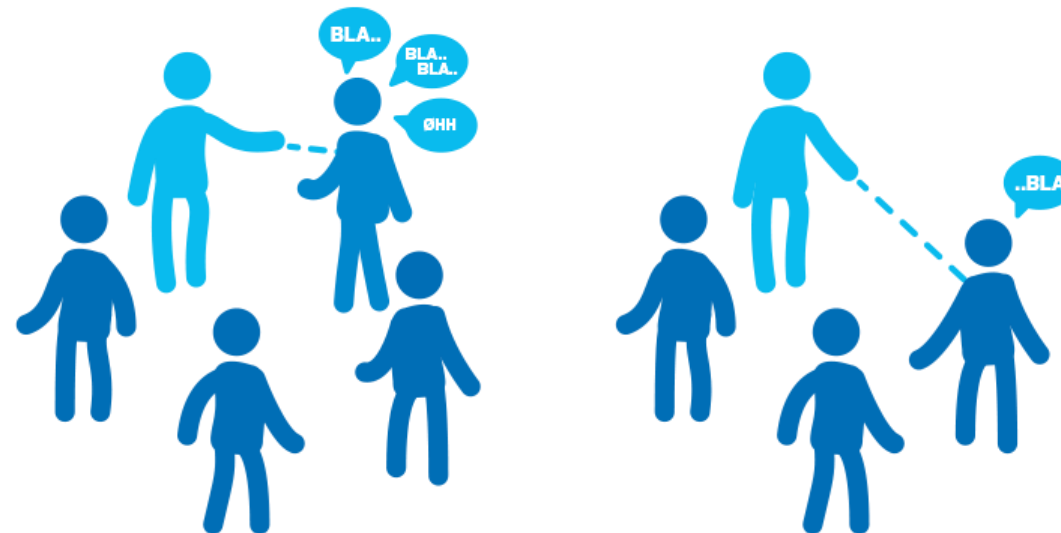


Social Beings



Social Beings

- Obtaining such acceptance is a long and difficult task that may entail years of learning how to behave in socially acceptable ways, **acquiring marketable skills**, **cultivating good relationships**, and **building a favorable reputation**
- To succeed at those endeavors, people must have an effective capacity for altering their behavior so as to conform to externally and socially defined standard
- Human beings long for the acceptance, because we are social animals
- **Afraid of getting negative feedbacks and social exclusion**



Previous Studies

- Increase in fear of getting negative evaluation is frequently observed in social anxiety disorder (Kajimura, Kochiyama, Nakai, Abe & Nomura, 2015)
- A chronic psychiatric condition characterized by fear and avoidance of social situations (Goldin et al., 2009; American Psychiatric Association, 2013)
- Social anxiety appears to be represented on a spectrum ranging from subclinical behavior (e.g., shyness) to clinical manifestation (Stein et al., 2007; Schmidt, 2012; Gentili et al., 2015)
- According to the Ministry of Health and Welfare, people in 70s, living in rural area, having low education are more vulnerable to SAD in South Korea (MoHW, 2016)

Previous Studies

- Fear of negative evaluation scale scores and fc of parahippocampal gyrus and orbitofrontal cortex and the betweenness centrality of the right parietal cortex were negatively correlated (Kajimura, Kochiyama, Nakai, Abe & Nomura, 2015)
- Resting alterations, particularly in the Default Mode Network, visual sensorimotor, and affective networks, have been shown to distinguish between clinical and nonclinical Social Anxiety Disorder population (Liu et al., 2015)
- Inagaki & Meyer, 2019
 - Greater DMPFC subsystem connectivity at rest was associated with greater support at the time of the scan and one month later, after adjusting extraversion
 - DMPFC subsystem integrity at rest is also associated with the dampened withdrawal response proposed to facilitate care for others in need



“What is association between the fear of negative evaluation and default mode network (DMN) in older adults in South Korea?”

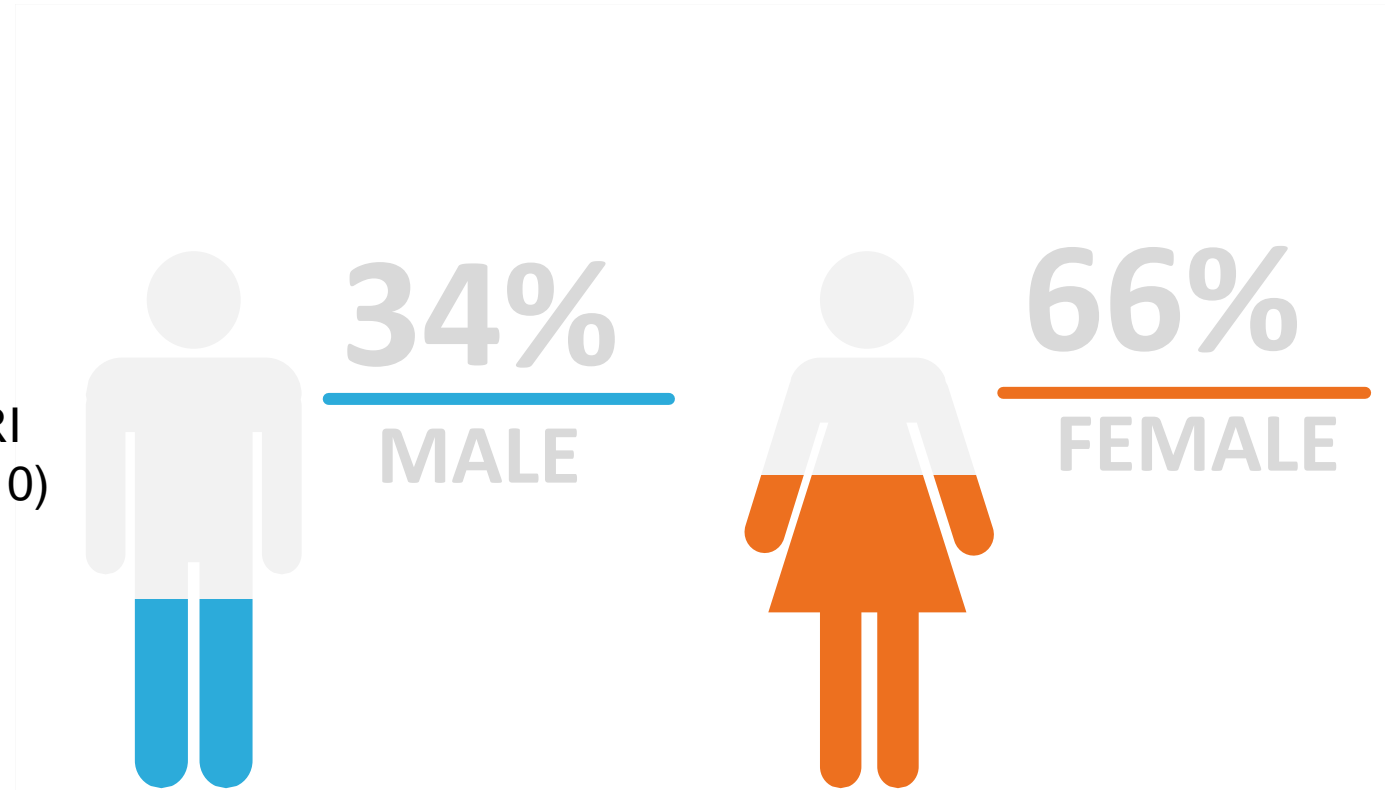
NOW

Methods



Participants

- Korean Social life, Health, Aging Project(KSHAP)m N= 126
- Living rural area, Township K
- Inclusion criteria
 - Complete 2 sessions of resting state fMRI
 - Cognitively Healthy Older Adults (CDR = 0)
 - No neurologic conditions
 - Head motion
- N = 90
- $M_{\text{age}} = 71.74$, $SD_{\text{age}} = 6.67$
- Male = 31, Female = 59



Demographics – age & education

	All Participants (N = 90)
Age	
60 – 69	38 (42.2%)
70 – 79	42 (46.7%)
80 +	10 (11.1%)
Sex	
Female	59 (66%)
Male	31 (34%)
Living rural	
Yes	90 (100%)
No	0 (0%)

	All Participants (N = 90)
Education	
No schooling	4 (4.4%)
Elementary school	49 (54.5%)
Middle school	16 (17.8%)
High school	13 (14.4%)
University +	8 (8.9%)
Self-rated health	
Poor	2 (2.2%)
Fair	19 (21.1%)
Good	48 (53.3%)
Very good	19 (21.1%)
Excellent	2 (2.2%)

- According to the Ministry of Health and Welfare, people in 70s, living in rural area, having low education are more vulnerable to SAD in South Korea

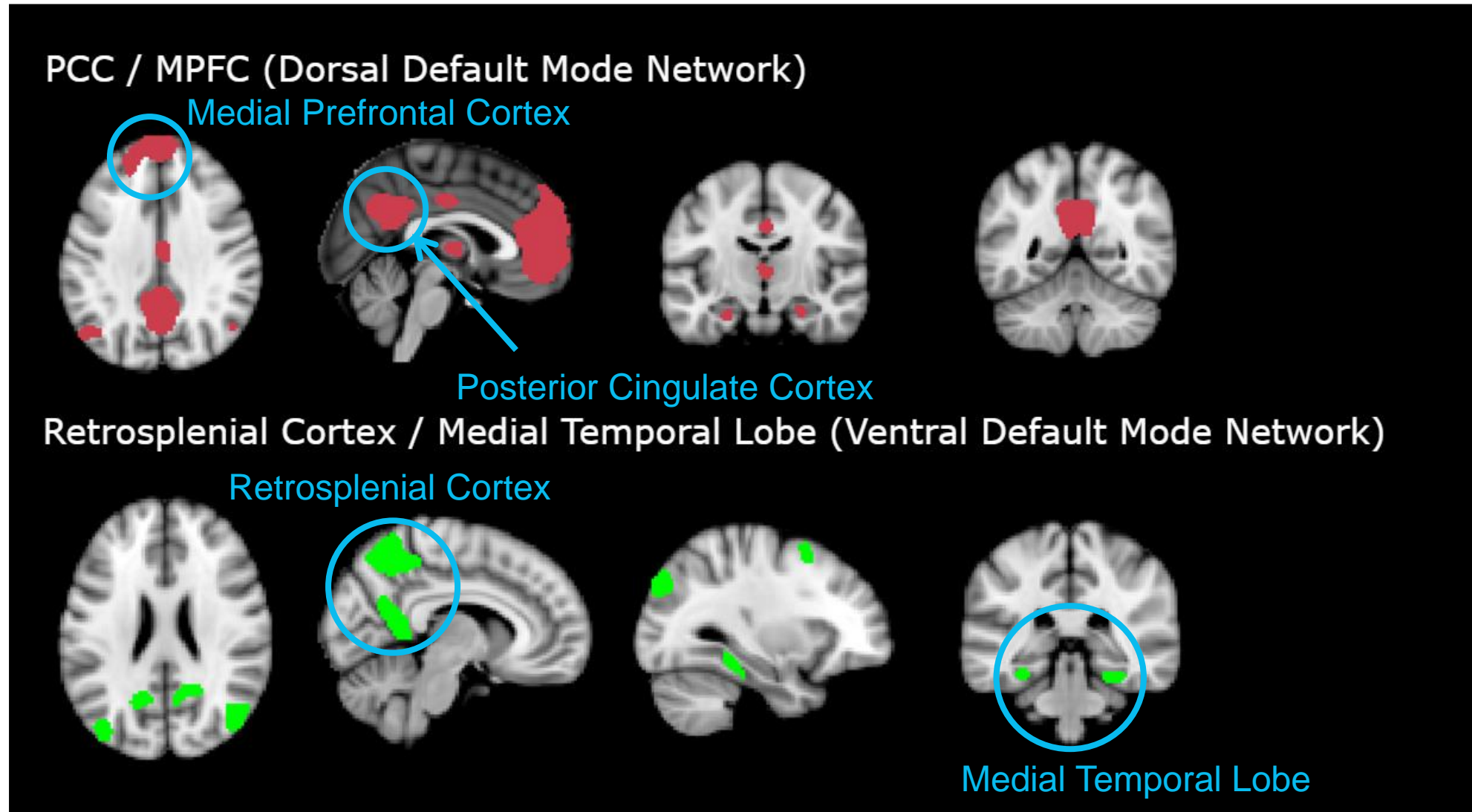




- Resting State
 - TR = 2s, TE = 30ms, voxel = 3*3*3 (gap = 1mm)
 - 10 minutes (300 volumes)
 - “please be awake, do not fall asleep”
- Preprocessing
 - people with excessive head motion were excluded (max < 4.5, mean < 0.6, n = 90)
 - MNI registration
 - Realignment, Slice timing correction, Smoothing (8mm)
 - Artifact Detection Tools, global mean intensity ($Z > 5$), movement > 0.9mm
- Brain connectivity Strength
 - Conn toolbox (18.a; Whitfield-Gabrieli & Nieto-Castanon, 2012)
 - ROI-to-ROI connectivity strength was calculated as mean connectivity value within ROIs



ROI Selection



K-BFNE II

F. 부정적 평가에 대한 두려움 척도(K-BFNE2)

다음 문항을 잘 읽고 자신과 가장 가까운 것을 1개만 골라 (V) 표시 해 주시기 바랍니다.

	1	2	3	4	5
1. 다른 사람들이 나를 어떻게 생각하는가 하는 것이 중요하지 않다는 것을 알면서도 이에 대해 걱정한다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
2. 사람들이 나에게 대해 좋지 않은 인상을 가진다면, 나는 그것에 대해 고민한다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
3. 사람들이 나의 결점을 알아차릴까봐 자주 두렵다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
4. 내가 다른 사람에게 어떤 인상을 주는가에 대해 거의 염려하지 않는다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
5. 사람들이 나를 인정해주지 않을 것 같아 걱정된다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
6. 나에게 대해 다른 사람들이 어떤 생각을 가지고 있을지 신경 쓴다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
7. 나에게 대한 다른 사람들의 생각에 신경 쓰지 않는다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
8. 내가 다른 사람에게 어떤 인상을 주는지 걱정한다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
9. 누군가가 나를 평가하고 있다는 것을 알면 나는 신경을 쓴다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
10. 누가 나를 평가하고 있는 것을 알지라도 그것 때문에 영향 받지 않는다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
11. 나는 잘못 말 하거나 잘못 행동할까봐 종종 걱정한다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다
12. 다른 사람들이 나의 실수를 알아챌까봐 두렵다.	매우 그렇지 않다	그렇지 않다	보통이다	그렇다	매우 그렇다

- _____ 1. I worry about what other people will think of me even when I know it doesn't make any difference.
- _____ 2. I am unconcerned even if I know people are forming an unfavorable impression of me.
- _____ 3. I am frequently afraid of other people noticing my shortcomings.
- _____ 4. I rarely worry about what kind of impression I am making on someone.
- _____ 5. I am afraid others will not approve of me.
- _____ 6. I am afraid that people will find fault with me.
- _____ 7. Other people's opinions of me do not bother me.
- _____ 8. When I am talking to someone, I worry about what they may be thinking about me.
- _____ 9. I am usually worried about what kind of impression I make.
- _____ 10. If I know someone is judging me, it has little effect on me.
- _____ 11. Sometimes I think I am too concerned with what other people think of me.
- _____ 12. I often worry that I will say or do the wrong things.

- 1 = Not at all characteristic of me
 2 = Slightly characteristic of me
 3 = Moderately characteristic of me
 4 = Very characteristic of me
 5 = Extremely characteristic of me



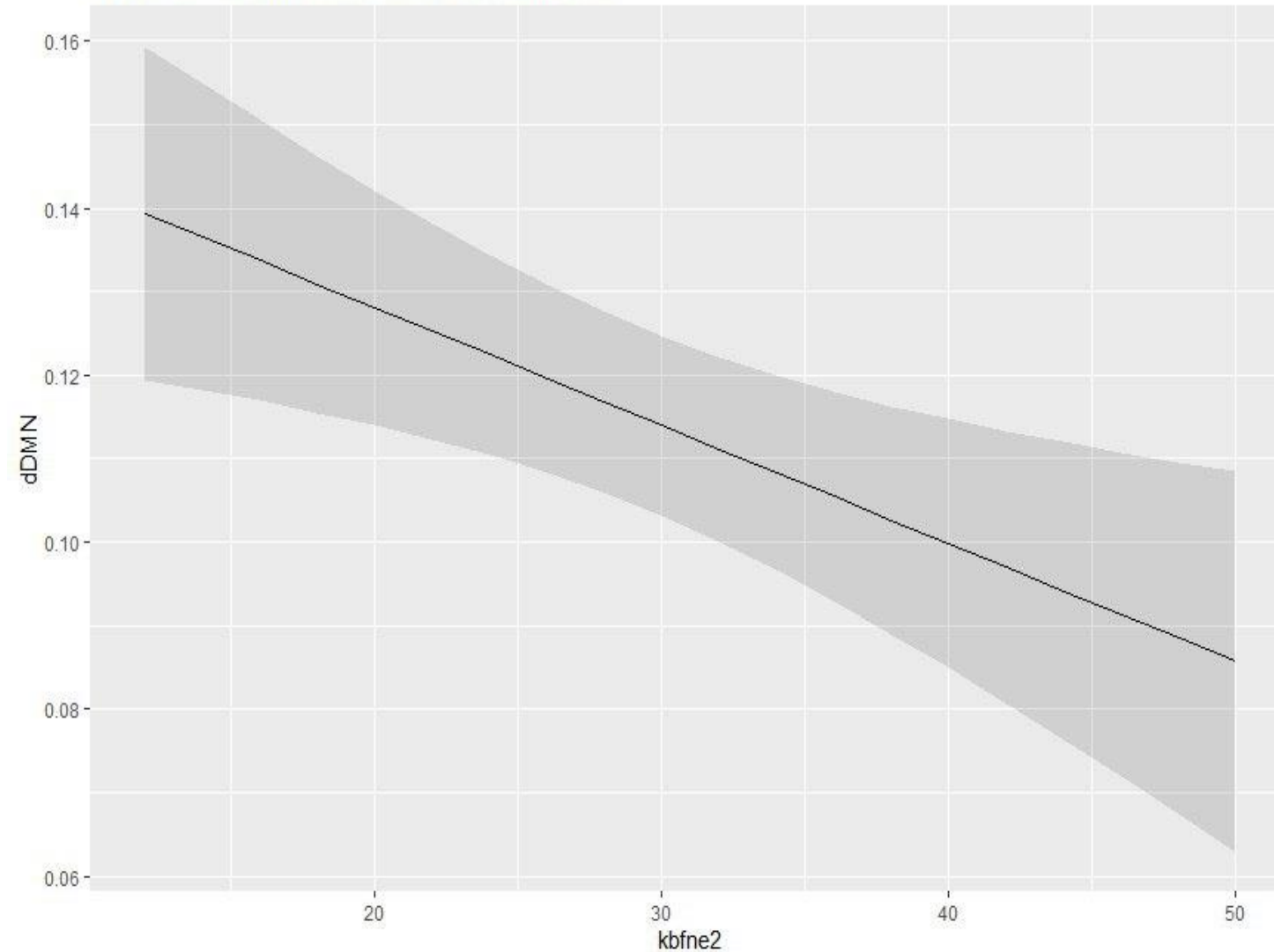
NOW

Results

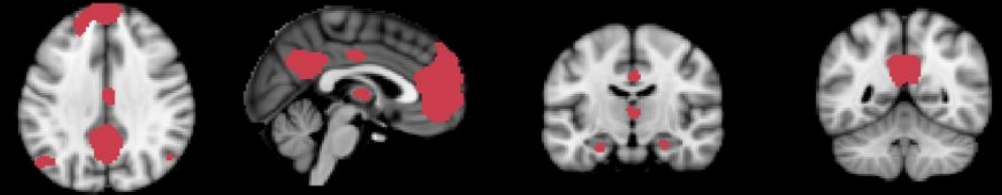


fMRI results

Partial Correlation Between kbfne2 & dDMN



PCC / MPFC (Dorsomedial Default Mode Network)



- $r = -.294$, $p = .006$
- After controlling age, sex, education, the correlation between fear of negative evaluation and within dDMN mean connectivity strength was significant

Implications

Implication #1

Since the dorsomedial DMN is known for its association with the ability to understand the others, this study suggests that the weakened dDMN connectivity may be an underlying neural mechanism of fear of negative evaluation or the response to significant negative evaluation from the past, which possibly influence on one's ability to understand others.

Implication #2

The result supported the perspective that social anxiety occurs on a spectrum and indicated that the K-BFNE II is a useful means of detecting neural alterations that may relate to the social anxiety spectrum.



Thank
You.

Seoul National University
JI SOO LEE, HARIN KIM, SEYUL KWAK, JEANYUNG CHEY

Acknowledgement :
Thanks to Dr. Chey and Seoul National University Cognitive
Neuroscience Lab members

