

## INTRODUCTION

- Major depressive disorder (MDD) is one of the most prevalent psychological disorders that presents a variety of chronic and recurring psychosocial hardships.
- Prediction of treatment outcome has been one of the core objectives in clinical research of patients with major depressive disorder (MDD).
- This study explored the possibility of event-related potential (ERP) markers to predict antidepressant treatment outcomes among MDD patients

## METHOD

### Participants Descriptive

- After eight weeks of antidepressant treatment, 61% achieved remission and 77% exhibited a successful treatment response rate.

Table 1. Descriptive statistics of remission status, treatment response, psychological measure, and neurophysiological measure data of participants.

Variable	Patient (n = 52)
<b>REMISSION STATUS</b>	<b>N (%)</b>
Yes	32 (61.54)
No	20 (38.46)
<b>TREATMENT RESPONSE</b>	
Successful	40 (76.92)
Unsuccessful	12 (23.08)
<b>PSYCHOLOGICAL MEASURE</b>	
Age (year)	45.87 ± 11.69
Sex	
Male	4 (7.69)
Female	48 (92.31)
Education (year)	13.42 ± 2.89
HAM-D (baseline)	26.13 ± 6.80
HAM-A (baseline)	25.13 ± 6.02
CORE (baseline)	4.35 ± 5.98
<b>NEUROPHYSIOLOGICAL MEASURE</b>	
LDAEP (μV/10 dB)	1.55 ± 2.85
MMN (μV)	-2.97 ± 1.34
Alpha asymmetry index of F5/F6	
Low alpha band	0.03 ± 14.13
High alpha band	-1.29 ± 13.16
Alpha band	-1.05 ± 12.73
Alpha asymmetry index of F7/F8	
Low alpha band	-1.73 ± 15.81
High alpha band	-2.96 ± 13.56
Alpha band	-2.80 ± 14.74

### Indices

Frontal Alpha Asymmetry (FAA)

Loudness Dependent Auditory Evoked Potentials (LDAEP)

Mismatch Negativity (MMN)

Melancholic score (MEL)

### Statistical Analysis

- The effect of group for each index on remission & on treatment response : chi-square analysis.
- The effects of each index on remission and treatment response: repeated-measures ANOVA.
  - Greenhouse–Geisser correction
  - One-way ANCOVA (age, sex, baseline HAM-D score, and medication types as covariates)
- Melancholia score x Indices: partial correlation (age, sex, baseline HAM-D score, and medication types)

## RESULTS

### Chi-square Analysis

- Patients who with low FAA F5/F6 (i.e., greater left frontal brain activity) were more likely to be remitted and show better treatment responsiveness than those who showed high FAA F5/F6 (i.e., reduced left frontal brain activity).

## ADDRESS CORRESPONDENCE

Seung-Hwan Lee, MD, PhD, lshpss@paik.ac.kr, lshpss@hanmail.net

### R-ANOVA Analysis

- MDD patients with low scores of FAA in channels F5/F6 showed a significantly higher remission/response ratio and better treatment responsiveness compared to those with high scores of FAA in channels F5/F6.

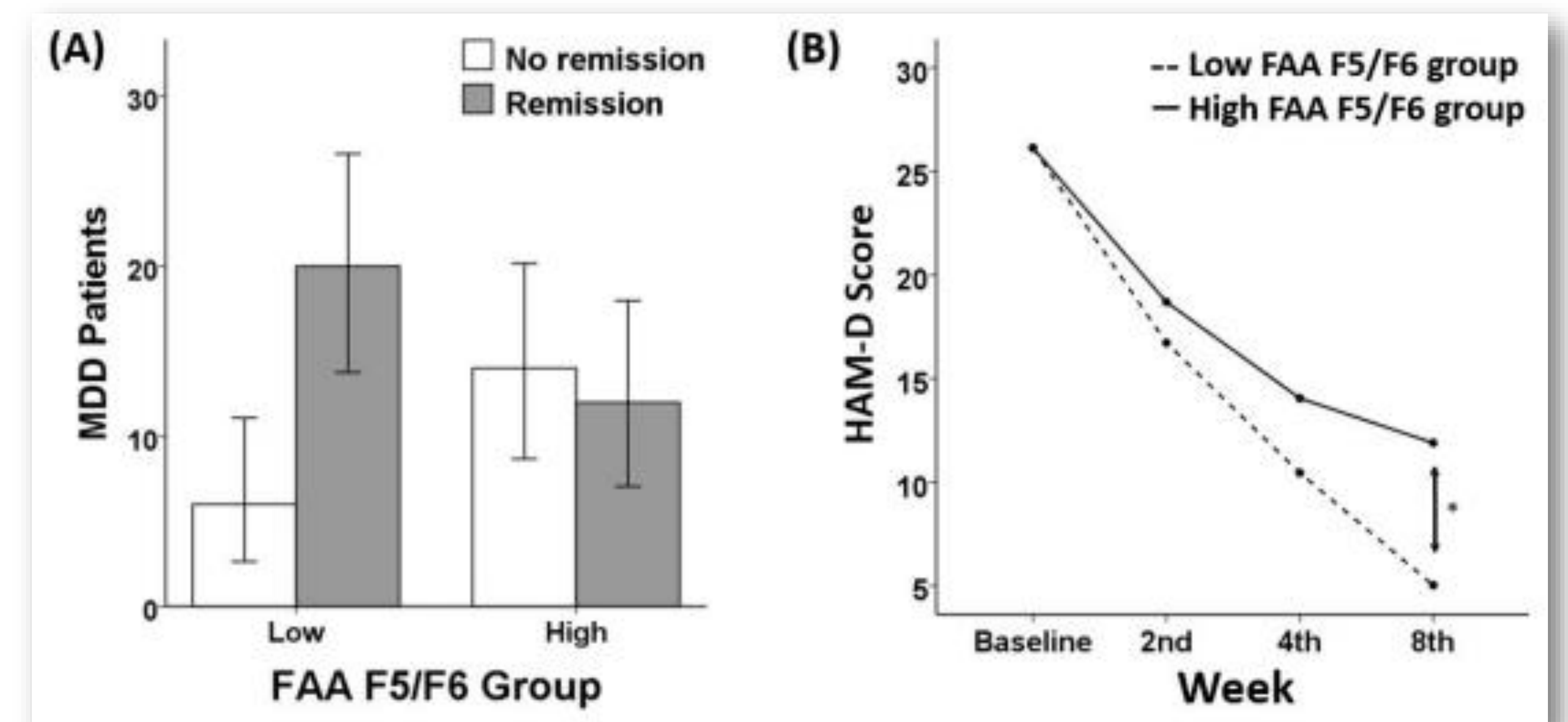


Figure 1. (A) Remission ratio by frontal alpha symmetry (FAA) F5/F6 groups (chi-square = 5.20,  $p = 0.023$ ) and (B) treatment responsiveness in HAM-D score over the eight weeks by Low and High FAA F5/F6 groups (rANOVA:  $F(2.560, 117.755) = 3.84$ ,  $p = 0.016$ ).

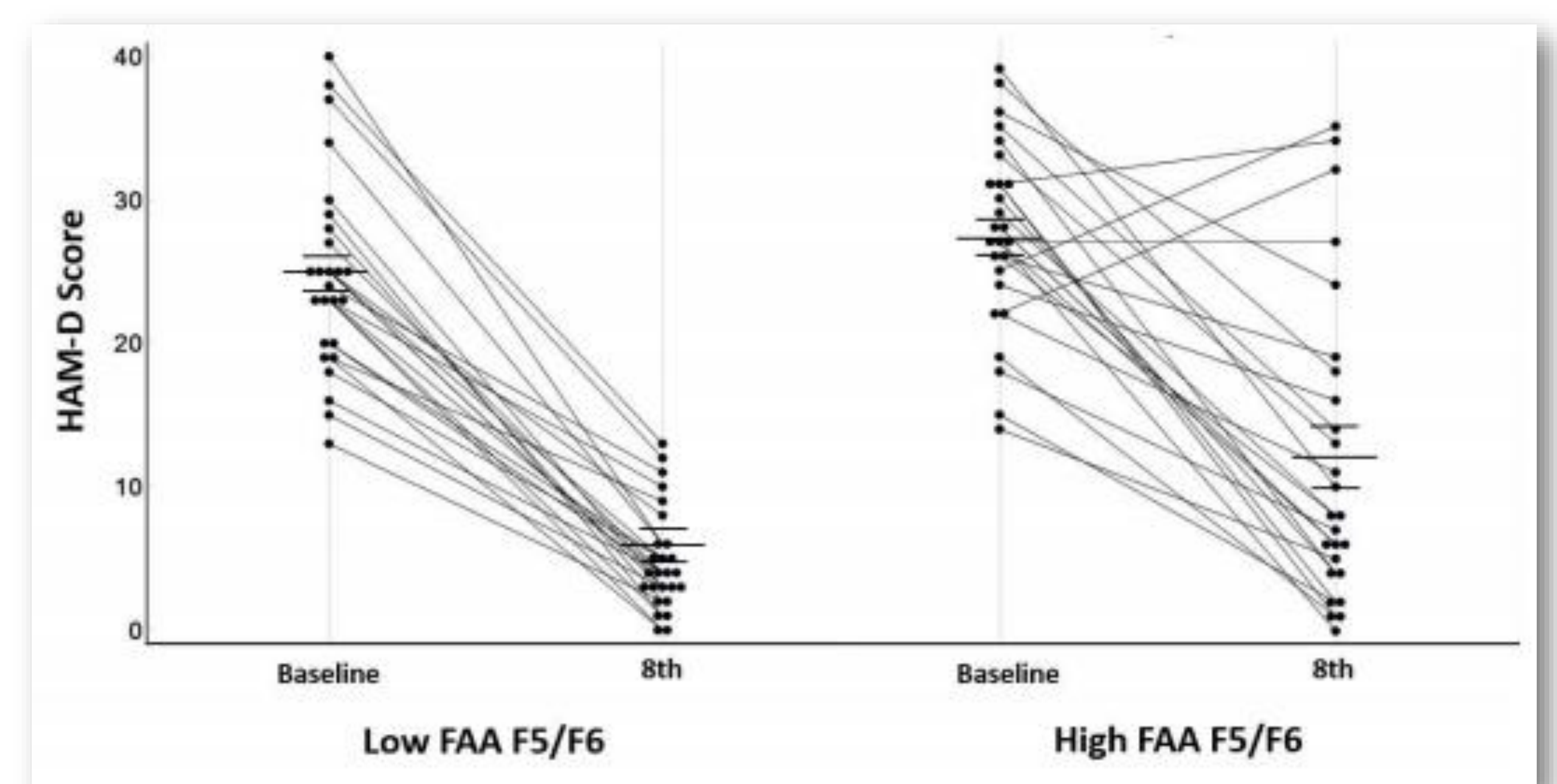


Figure 2. Parallel Coordinates of change in HAM-D scores from baseline to 8<sup>th</sup> week of treatment benchmark by Low and High FAA F5/F6 groups.

### Partial Correlation Analysis

- Greater FAA in channels F7/F8 was associated with greater melancholia scores, after controlling for age, sex, HAM-D score at baseline, and medication types.

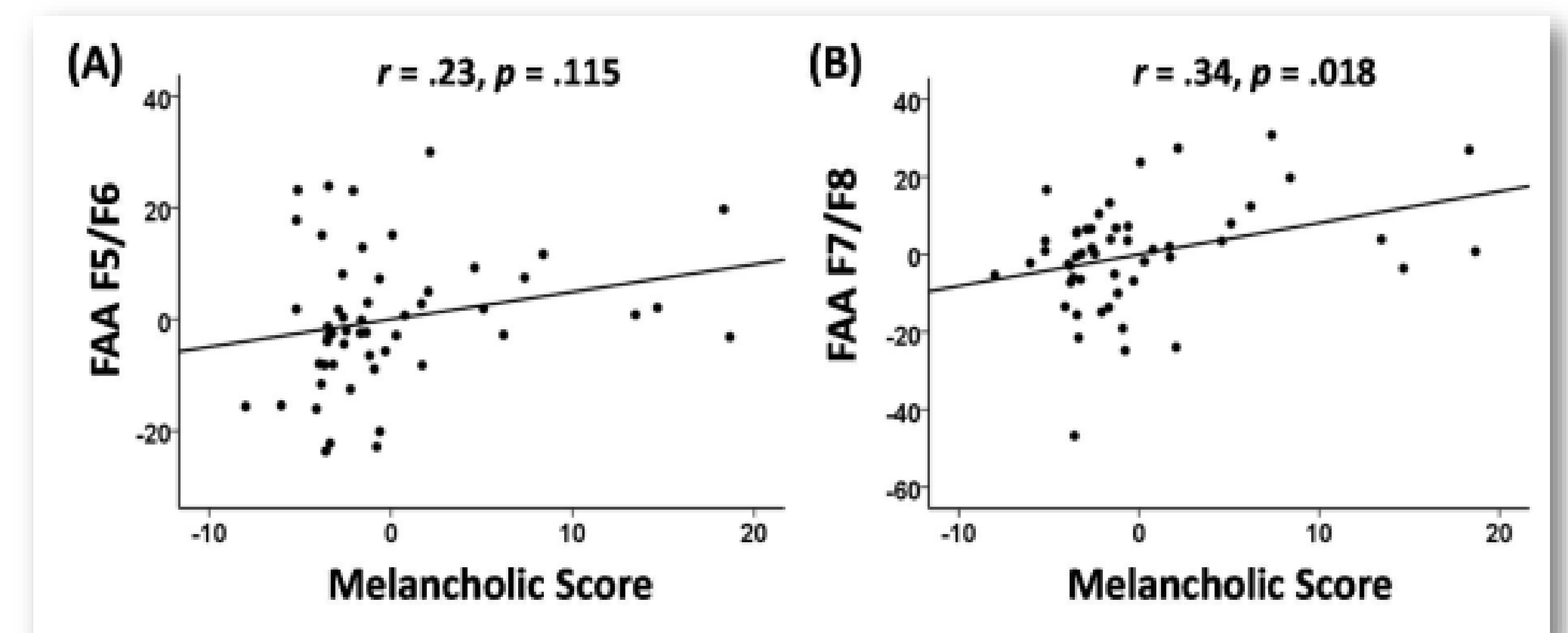


Figure 3. Partial correlation plots of the positive relation between (A) FAA F5/F6 and melancholia score ( $r = 0.23$ ,  $p = 0.115$ ) and (B) FAA F7/F8 and melancholia score ( $r = 0.34$ ,  $p = 0.018$ ).

## CONCLUSIONS

- The findings demonstrated that low FAA, or heightened left frontal activity, could indicate a better treatment outcome in terms of remission status among patients with MDD.
- FAA is likely to represent a melancholic tendency in patients with MDD. In sum, our results suggest that FAA could be a reliable biomarker to predict remission in the treatment of patients with MDD.

## ACKNOWLEDGEMENT

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