

The Association between Maternal Depression and Frontal Alpha Asymmetry in Infants: preliminary results from a South African birth cohort



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Background

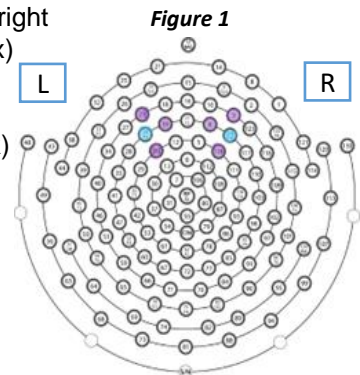
- Frontal alpha asymmetry is a marker for child outcomes (i.e.affect regulation).
- Studies have demonstrated a relationship between maternal depression and infant frontal alpha asymmetry. Results indicated that infants who have depressed mothers have greater right frontal EEG alpha asymmetry.²
- Greater right frontal EEG activity is related to '*withdrawal-oriented behaviour*'. And greater left frontal EEG activity is related to '*approach-oriented behaviour*'.¹

Objectives

- To evaluate the association between *antenatal* and *postnatal* maternal depression risk factors on:
 - Activation of EEG alpha power over right vs left frontal regions of the brain
 - Frontal alpha asymmetry

Methods

- **Participants:** 394 participants were recruited for a longitudinal study in Cape Town, South Africa. Infant data for this study was included at two age timepoints 3 (M=114 days) and 6 months (M=267 days).
- **EEG data: 3 (n=256) and 6 months (n=231)**
 - Low and High average alpha power (right and left dorso-lateral prefrontal cortex)
 - F3 and F4 alpha power
- **Maternal Depression:** EPDS (17% high risk)
- **EEG Processing:** MATLAB and HAPPE
- **Data Analysis:** Linear regression
 - 8 models: average alpha
 - 4 models: frontal asymmetry
 - F4 (R) – F3 (L)



Results

Average Alpha power

Association between Maternal Depression and Average Alpha Power

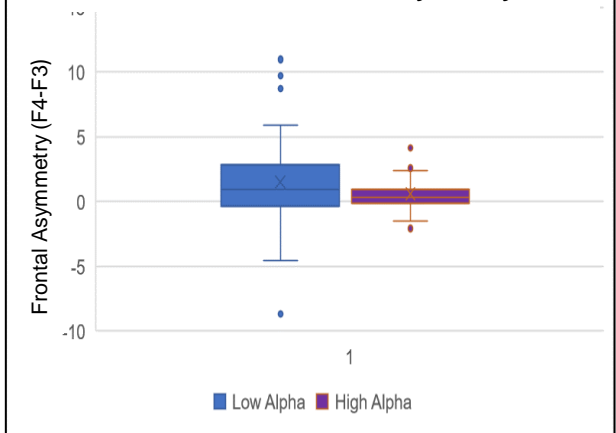
	3 Months				6 Months			
	Left		Right		Left		Right	
	Low	High	Low	High	Low	High	Low	High
<i>Antenatal</i>	x	x	x	x	x	✓	x	x
<i>Postnatal</i>	✓	✓	✓	✓	x	x	x	✓

Association between Maternal Depression and Frontal Asymmetry

	3 Month		6 Months	
	Low	High	Low	High
<i>Antenatal</i>	x	x	x	x
<i>Postnatal</i>	x	x	✓	✓

Frontal Asymmetry

High Risk Maternal Postnatal Depression and 6-month infant Frontal Asymmetry



Discussion

- **Postnatal maternal depression** has a greater effect on average alpha power in three-month-old infants and frontal asymmetry in six-month-old infants compared to antenatal maternal depression.
- These results indicate that infant interactions with mothers with postnatal maternal depression risk, influences the power and activity within the infant's prefrontal cortex, in comparison to the interaction between infant and mother while babies are in utero.
- Mothers with postnatal maternal depression are more likely to have infants at six months with **increased right alpha activity**, which is a predictor for the development of **withdrawal-orientated behaviour and low mood**³.

Acknowledgements



References

